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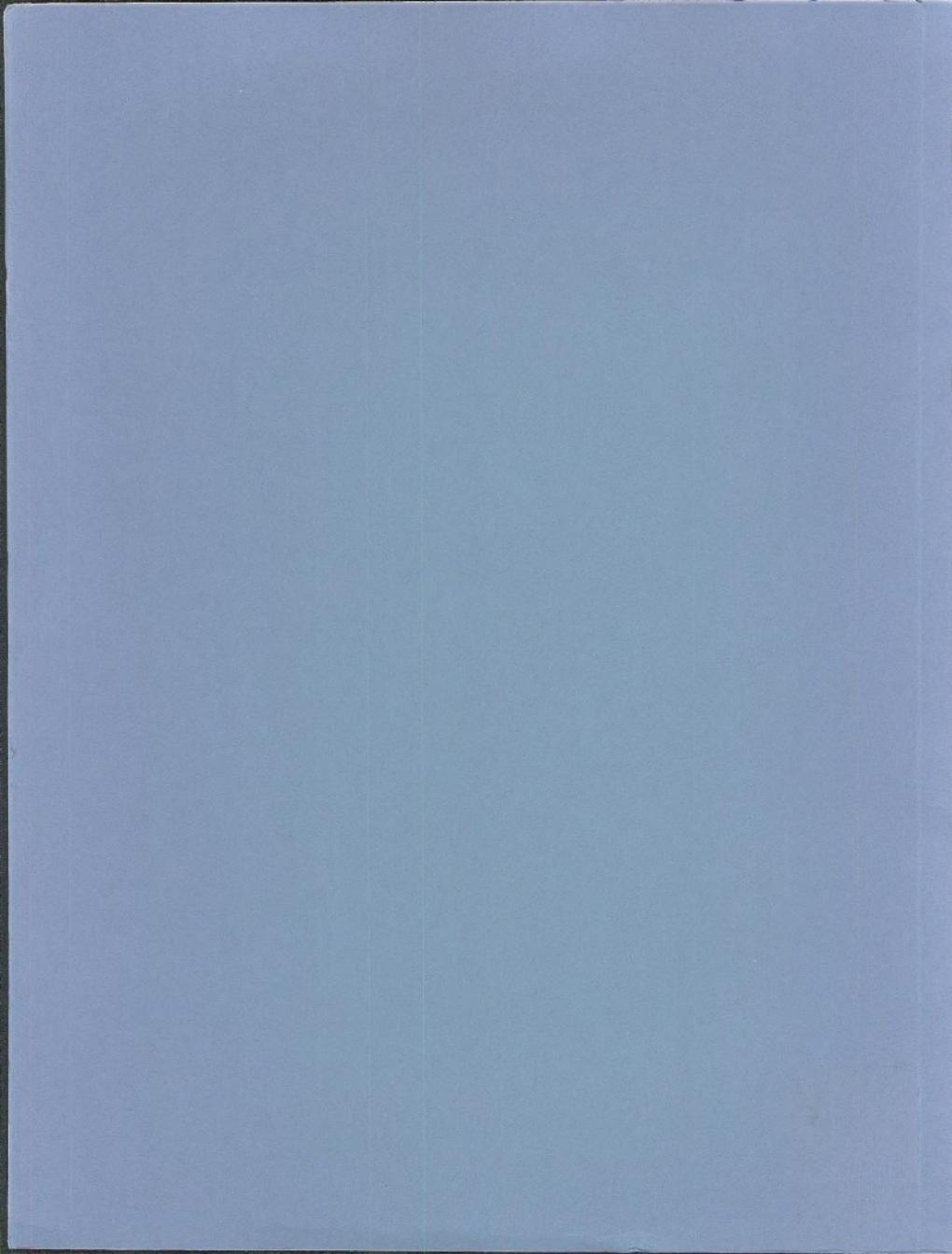
88012273

1983 MAPPING AND AERIAL PHOTOGRAPHY WORKSHOP

TR
810
.M36
1983



BUREAU OF LAND MANAGEMENT



11028303

Enclosure -- Info. memo DEC-83-63

ID 88012275

1983 BLM MAPPING & AERIAL PHOTOGRAPHY WORKSHOP

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ATTENDEES

WO - Dave Allen - WO-870

John Bebout (MMS) - Resource Evaluation Div., 653 National Center,
Reston, VA 22092

Butch Hayes - WO-200

Bernie Hostrop - WO-720

Paul Rogers - WO-720

Bob Schrott (MMS) - (Same as Bebout)

DSC - Jon Abrams - D-416

Bob Arndorfer - D-400

Wally Crisco (Workshop Coordinator) - D-416

Larry Cunningham - D-417

John Greene - D-417

Jerry Ives - D-410

Marilyn Mogg - D-417

Phil Schryver - D-417

Lorin Schwartz - D-442

Rosamond Warren - D-540

Pete Vanwheye - D-490

Alaska - Ray Thomas - AK-947

Arizona - Larry Taddia - AZ-941

California - John Key - Bakersfield Dist. Off., 800 Truxton Ave., Room 302,
Bakersfield, CA 93301

Colorado - Mike Dwyer - CO-945

Harold Martin - CO-940

Andy Kordziel - CO-945

Eastern States - Patricia Webb - ESO-942

Idaho - Gary Stevens - ID-941

Montana - Fred Batson - MT-931

Chuck Sigafoos - MT-941

Nevada - Diane Colcord - NV-941.5

New Mexico - Andy Dimas - NM-934A

Bureau of Land Management

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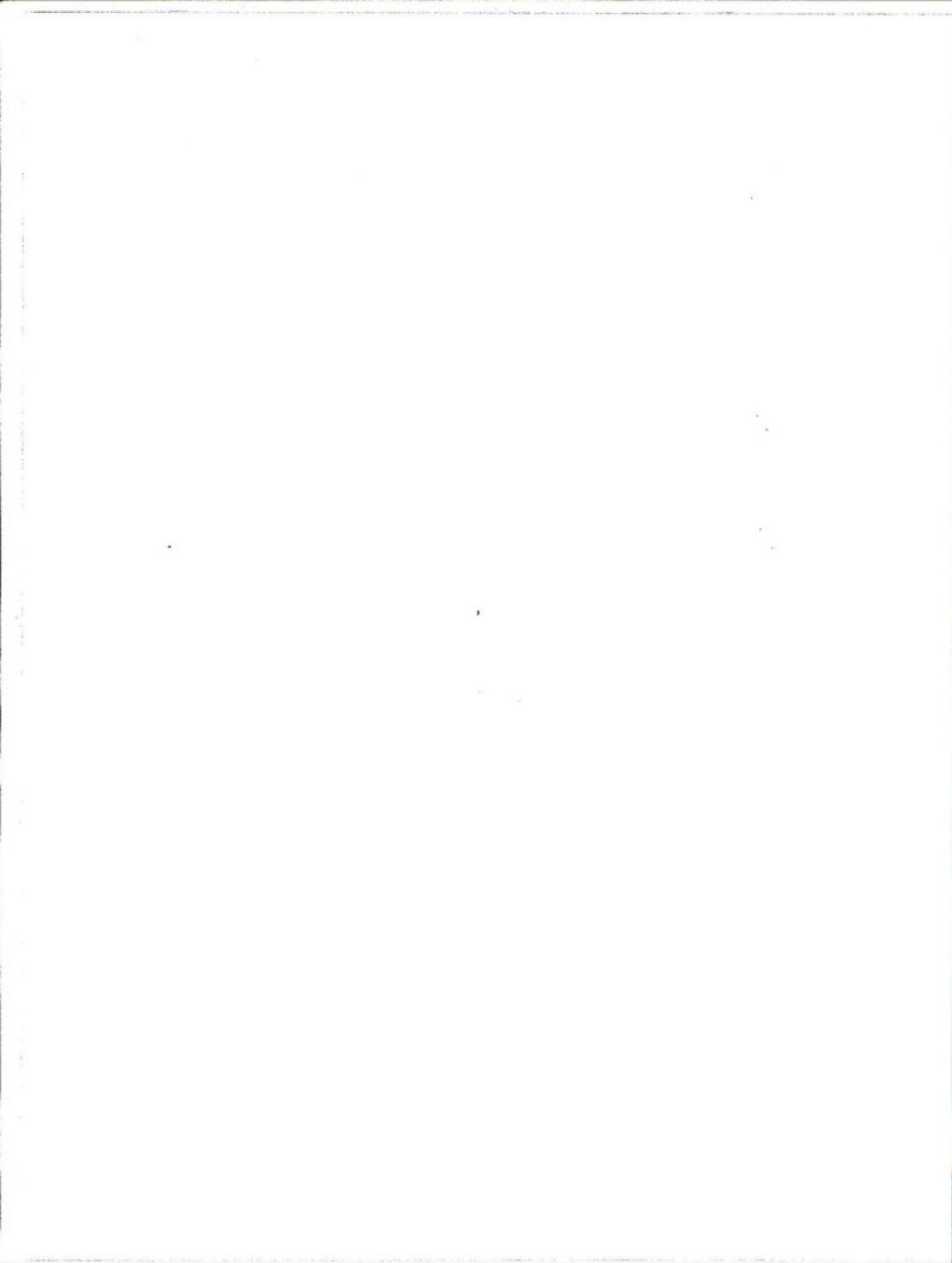
Art Martinez - UT-933

Bob Papworth - UT-940

Wyoming - Bruce Keating - WY-941

Jon Winemiller - WY-941

Encd. 1



FINAL AGENDA

BLM MAPPING AND AERIAL PHOTOGRAPHY WORKSHOP

TIME: February 22-25, 1983

PLACE: Holiday Inn Denver North, 4849 Bannock Street, Denver, CO (I-25 & I-70)

Tuesday, February 22

I. Introduction and Administration

Moderator -- Crisco

- 8:00 A.M. A. Opening remarks -- Arndorfer/Rogers/Papworth/Hayes
B. Introductions - Individual
C. Workshop preview and ground rules -- Crisco
(5-10 min each) D. State reports (highlights only) -- Rogers (moderator)
(Includes MMS)
E. Management research (organization) -- Warren
F. Work group (teams) report and recommendations -- Crisco
G. Agenda modification if needed as a result of work group
recommendations -- Crisco

II. Aerial Photography

Moderator -- Ives

- 1:30 P.M. A. DSC aerial photo staff and services provided
Hand-out Material Only
1. Update of services available
2. Price list information - Cunningham
3. Criteria for low-altitude photography for use in
trend and monitoring studies -- Cunningham
B. NHAP Program -- Rogers
1. Camera and film systems for future coverage
2. Prices of products, availability, sources
3. BLM future involvement in the program

Tuesday Cont.

C. MMS aerial photography needs -- Bebout

D. Training and development -- Abrams
(Includes training needs)

III. Photolab

Moderator -- Schryver

3:00 P.M. A. Products--film reproducibles, etc.
(Includes GS catalog)

B. Services available -- Grimes

C. Photo reproductions and color balance problems -- Revette

IV. Cooperative Agreements/Memorandum of Understanding

Moderator -- Rogers

3:30 P.M. A. USGS/BLM production, storage, and distribution of the National Mapping Program

4:00 P.M. -- Work Group Meetings

Wednesday, February 23V. Mapping

Moderator -- Winemiller

8:00 A.M. A. 100K mapping program

1. Review of program -- Mogg

2. 83 schedules

3. Plans for digitizing 100K's (will DSC do it?)

(Hand-out only) 4. Problems associated with protraction diagrams not matching ground surveys -- Greene

5. Contract labor cost for peeling, expected accuracy, accuracy received, and utilization of contracts

B. Printing costs and regulations (BLM/Dept/JCP) -- Sigafoos

C. Miscellaneous subjects on mapping

1. How will the role of mapping sciences coordinator operate in the SO's

Wednesday Cont.

2. Map sales--standardize prices
3. A-76 evaluation, BLM S.O. approach (how's, why's, concerns)
4. A-16 reply--experience with this year's procedure and recommendations for change
5. Design maps that will serve BLM managers and the public (include folding)
6. MMS mapping needs -- Bebout

VI. *Automated Cartography

Moderator -- Keating

- 1:30 P.M.
- A. What is cartography's involvement in:
 1. Automated Land and Mineral Record System (ALMRS)
 2. Public Land Survey System (PLSS) including standardization of digital requirements for status portrayal
 3. Interfacing of BLM mapping data and automated record system
 - B. Geographic Information System (GIS)
 - C. Dem (needs, uses, in remote sensing) -- Schwartz
 - D. Compatibility of data with existing systems (Remote Sensing, Graphics, Land Records) -- Schwartz
 - E. Accuracy requirements of various disciplines for inventory data and the levels of remote sensing required -- Schwartz
(Includes what's going on in marijuana detection)
 - F. Map digitizing--accuracy standards
 - G. Reproduction of computer plotter products
 - H. C.O.S. output and needs .
 - I. Support needs from G.S. and other agencies
 - J. Coordination/cooperation with other agencies
 - K. Training and Mapping Development -- Abrams

Wednesday Cont.VII. Funding

Moderator -- Hayes

- 3:00 P.M. A. Process (how to fund)
1. Pre-PAWP
 2. State/DSC PAWP Coordination
 3. AWP
 4. W.O. (map funding to states)
 5. Funding process for state supported mapping at DSC
(Includes aerial photo reproductions)
 6. Photolab-aerial photography support
 7. Photogrammetry
- B. Update on present and future budget outlook for aerial photography programs

Thursday, February 24VIII. Photogrammetry

Moderator -- Rogers

- 8:00 A.M. A. Update of services available
- B. S.O. needs and potential
 - C. Relationship to digital mapping
 - D. Future trends (outlook)
 - E. MMS needs

IX. Miscellaneous Topics

- A. Additional funding items
 1. 4920 funds
 2. Inter-office Agreements
- B. The need for ortho photo equipment at DSC

End. 2-4

Thursday Cont.

Afternoon Work groups meet to discuss the issues/problems, state the scope, and prepare final recommendations for the following issues/problems:

1. 100K revision plans--Lead -- Mogg
2. Automated cartography--Lead -- Keating
3. Design a uniform transportation map series for districts--Lead -- Dwyer
4. Printing costs and regulations--Lead -- Sigafoos
5. Reevaluate needs and priorities for ortho photo quads--Lead -- Thomas/Harne

NOTE: Work group recommendations are to be turned in to Crisco by 3:00 p.m. today.

Friday, February 25

8:00 A.M. Hand-out copies of work group recommendations and action items.

- X. Final Work Group Reports and Recommendations -- Crisco
XI. Final Wrap-up -- Rogers/Crisco



BLM Mapping and Aerial Photography Workshop

February 22-25, 1983

The workshop coordinator (Crisco) opened the workshop promptly at 8:00 A.M. A list of attendees is enclosed (Encl. 1). It was learned (2 hrs. later) that the recording device was not working. The following is a summary of the proceedings including: Opening Remarks; Introduction; Workshop Review and Ground Rules; and State Reports.

OPENING REMARKS

Opening remarks were provided by Bob Arndorfer, Bob Papworth, Paul Rogers, and Butch Hayes.

Arndorfer's Presentation: Late last week I was asked to substitute for Bernie Hostrop who will be here later today.

At the time I planned the standard - Welcome to Denver, see the sun we provided, see the sights on E. Colfax with guides Bruce Keating, Ed Harne and Ray Thomas, my you have an exciting and fun filled agenda etc.

Yesterday afternoon, after looking at your basic dull agenda - and having a couple of mind clearing libations, I decided to take a different approach.

With a few exceptions, mapping in the Federal Government is being performed with 30 year old technology. BLM is no different. We have had digital technology at our fingertips in BLM for 5 years or more but we have yet to exploit it in an organized way.

A larger problem is our failure to step back and take a more global look at the BLM mission and look for a "better mousetrap."

It is a sad commentary on the way we do business when a box of colored pencils is still an important tool to a range conservationist, biologist or adjudicator, and when all but a few of the thousands of thematic overlays used in land use planning are created and revised with "quill pen" methods.

It is embarrassing to have to say that in the mid-1980's we are no smarter than we were in the middle of this century, and that we have no plan to enter the 21st century in any better shape.

BLM seems determined to perpetuate the mid 20th century by allowing everyone the option of doing their own thing. The worst evidence is in HQ. If an air photo is used for mapping, cadastral is the lead organization. If the same photo is used for resource analysis, Information Systems has the lead. The same split is true in base and thematic mapping - with the planners adding a further complication with their own mapping program.

In the meantime, the people in Lands, Minerals and Renewable Resources (who foot the bill) are in a quandry. Why should they pay for maps and gee whiz technology when budgets are declining and technical staff are being laid off.

There is a better way.

While everyone else was talking about it, BLM developed an operational remote sensing capability.

We have sophisticated Geographic Information Systems available in half of our states.

We are embarking on a program to automate the land and mineral records of BLM. This system will include a data base of geographic coordinates of the Public Land Survey System so that land and mineral status can be mapped.

We have the largest unmet information need of any agency both in terms of area of interest and variety. With the recent merger of on-shore minerals, BLM is the only federal agency with responsibility for the entire spectrum of resources on the land we manage.

Our challenge is two fold:

1. Help our managers articulate their needs in our terms. This means getting inside their heads. Find out what they mean when they say they need a map. Most of the time they mean they need certain kinds of information which have always been displayed on a map because they didn't know how else to do it.
2. Our second challenge is to provide the information in a cost effective fashion. This means it has to be cheaper, quicker and better than the old way. We need to think in systems terms rather than map terms.

We have to stop the petty turf battles at all levels. Organizations are made up of people and people can make any organization work or fail.

This is a time of massive change in BLM - and with change comes personal and organizational stress. It is also a time of opportunity. While others are

distracted by change, the door is open for us to take that step back. We need to integrate our technical capability with our professional knowledge and judgement to find that "better mousetrap" for BLM.

I have to say that I don't see much on the agenda leading us in that direction. I hope that you will decide to redirect some of your effort.

Papworth expressed concern that even though the agenda addressed many of the existing problems, it did not seem to deal with the long range goals of the mapping program, per change 1 to Instruction Memo 83-198. He also wanted to learn from this workshop - where is the Bureau Cartography Program and where is it going. What is the Service Center's role and what is the State Office role and what is the future of the program. He cautioned about the use of jargon or shop talk language, especially when dealing with managers who need to understand what is going on in order to provide funding.

Rogers said that the last true gathering such as this was in 1978 in Cheyenne, Wyoming. He stated that the results from that workshop were less than overwhelming and action items were not followed through on or at least not made known. He also felt that W.O. attendees at that workshop had come with decisions already made. He urged the attendees to communicate with W.O. as to what they are planning for the future and help provide solutions to existing problems. He assured the attendees that we will be responsive and that WO-720 plans to make mapping a viable program. He pointed out that Dave Meier has established a mapping advisory committee in D.C. and each state office now has a single point of contact for Mapping Sciences. He will send out this information as to who the mapping advisory group and the Mapping Sciences coordinators are upon his return to W.O. He encouraged the attendees not to waste time with petty differences and arguments but, rather discuss the issues and do something about them. He pointed out that this is the states workshop, they asked for it and that we have in attendance, two W.O. program leaders who came with open minds to hear what they have to say about where the program should be, where it should be headed, how do we fund it, and how do we incorporate the MMS requirements in it.

Hayes explained that he was at the workshop as a joint spokesman for renewable minerals and budget. He stressed that in order for the mapping and aerial photography programs to be viable programs, each state must be involved and become more active (visible). Don't let one or two states set policy for the whole Bureau. He emphasized that we need to identify who the users are and therefore expect funding from those activities. Also he indicated that he came with an open mind to hear what the S.O. representatives had to say.

INTRODUCTIONS

Introductions consisted of asking each attendee to stand and introduce themselves and state their positions.

WORKSHOP PREVIEW AND GROUND RULES

Crisco gave a workshop preview and explained that agenda items received from state office feedback had been lumped by category. He also explained the ground rules and why it was necessary to have them - principally to avoid confusion and assure fairness to all states.

STATE REPORTS

Summary of State Reports: Most states (Cartographic Functions) report having funding problems; are located in different organizational legs; have communication problems; are responsible for various types of mapping projects such as; Topographic mapping, EIS support maps and drawings, Ranch Boundary maps, Grazing Allotment Series maps, Court Exhibits and Riparian mapping, Boundary Survey maps, 100K Mineral Management maps, 500K state maps,

1:1,000,000 maps, Acquisition and Easement drawings, Indemnity Land Sales maps, Automated mapping (digitizing), preparing Cadastral Survey Plats, Resource maps, Visual Aids for training, Organizational Charts, Geologic maps, Mining Operations, Recreation maps, Orthophoto Quad coordination or production, visual products for Resource Management Plans (RMP's), Vegetation mapping and Range Improvement Overlays, Soils maps, Wilderness maps, Archaeological maps and Cultural Resource Projects, Asset Management maps and overlays, other Administrative maps, Forest types, and miscellaneous maps. They are usually responsible for the aerial photography program including the National High Altitude Photography program, Resource Photo coverage, Special photography, (e.g trend analysis), large scale imagery for stream classification and riparian vegetation analysis, topographic mapping photography and in some cases the various aspects of remote sensing including computer analysis. In some states the photogrammetry staff also establishes geodetic control.

Parts of some states programs are congressionally mandated, such as Alaska's passage of title for state and native selections. Alaska's highest priority for the next 5 years is the conveyance of land to the State of Alaska and to native corporations.

Also, there will be new requirements in the mapping program due to the merger with onshore MMS.

Funding coordination with all the activities involved is a monumental task. It was generally agreed that we must look for new and better (more efficient) ways to fund the cartography programs as well as more efficient ways of meeting the incumbent requirements of the profession.

MANAGEMENT RESEARCH

Roz Warren gave an update of the Management Research activities.. She explained that efforts had pretty much been put on hold since the MMS merger. She also explained the type of things the team is looking into. They have solicited data via a questionnaire. To date they have collated all the user responses and the producers, supervisory and non-supervisory. They hope to get back on track in April after having been pulled off for another assignment. They will compile a written report to be eventually presented to the Directorate and then sent to the field. Roz estimates 2 workmonths will be needed for completing the effort.

WORK GROUP REPORTS AND RECOMMENDATIONS

Marilyn Mogg presented plans for revision of the 100K program, but she also emphasized the need to complete the program. She introduced the members of her work group - Diane Colcord, Larry Taddia, Gary Stevens, and Butch Hayes.

She presented options for continuation of the 100K program and the costs that will be involved in the revision phase. These options include funding for continuation of the program. Automation, how we can go about automating the program and its impact on the completion and costs. She asked her work group to review the package, evaluate the data included, make recommendations for final completion of the program and any other input they wish. A copy of her report and recommendations is included in this report.

John Greene presented his topic Storage and Distribution and stated that he was the work group. He stated that the topic should have dealt primarily with storage of the 100K thematic plates. He pointed out that previous feedback from the states indicated support for a central storage of these plates at DSC.

He stated that the initial (first year cost) will be about \$18,000 to \$20,000. He recommended using the K & E Suspend X system.

He estimated it would take about 2 work months to set up the system in addition to the \$20,000 costs. He also presented hand-outs showing the Suspend X system.

He pointed out that by having this central storage it would save time in acquiring products from GS.

He explained the current procedure of handling press ready products utilized in making the 100K maps.

He pointed out that several states had programmed funds in FY 83 in support of this idea, but for some reason some of the funds were withdrawn. He also urged the states to re-identify funding support for the effort.

John's report was accepted by all and no further work group activity was called for.

Bruce Keating: I'm handling automated cartography and basically it will be the answering of questions and what it is, how it fits in cartography within the state office and the Denver Service Center. This group will be identifying problems, and making recommendations about equipment capabilities.

You can hear a lot of disparity here between BLM organizations; personnel, standards, other agencies like USGS, DEM's, DLG's, we will be covering that and hopefully come out with some recommendations. We plan to very strongly consider the user, that is, how will digital cartography be used in the Bureau. Is it going to be used as a GIS for analytical needs or are we looking at digital cartography for an end in itself. We're looking at it as being more of an analytical output type system, anyway that is my editorial. I have identified work group members Ray Thomas, Mike Dwyer, Fred Batson, Ed Harne, and Marilyn Mogg. Some of these people have things to do on other committees, but I wanted to try to get some different organizational flavor. I'd like to see if one of the MMS people would like to sit in on the automated cartography. You can see me at the end of the session. I've probably overlooked several people that have strong interests in this area and anybody even if you don't have a digital operation, your input is needed because that's a problem too and yet we want to make this committee problem oriented and identify issues.

Mike Dwyer - CSO: Designing Uniform Transportation Map Series for the Districts.

I think I was possibly volunteered to head up this work group since I authored the Carto Manual Section on this. I hope to do about four things in this work group and I've asked Jon Winemiller and Art Martinez to be on it so far.

1. Decide if a standard bureau transportation system exists. It would be nice to know if there is one, if we are going to standardize the transportation maps. Actually what the pre-work group consisted of was myself spending a few days in the library digging through the manuals, especially the engineering manuals and supplements and etc., to see if such a thing existed.

2. Design a standard transportation map for possible recommendation from a cartographic standpoint. That is, we don't want to pretend to tell the engineers what they need, but we can certainly make a recommendation about cartography that will meet their needs. 3. Discuss the feasibility of the standard. Of course there are going to be problems between the states, between the engineers, etc., and the funding alone is something that is going to make a big difference. For instance, Colorado has really been pushing for transportation maps, and we've been able to publish relatively expensive multi-color transportation maps. Some of the states can't afford that but that's where our engineers want our money to go, so that is what we are going to do. 4. Make recommendations and hopefully two recommendations. First, is standardization feasible, just the subject of standardization, and secondly, we will come up with a standard map or possibly a couple of maps that we consider good possibilities for uniform transportation maps. If anyone else would like to serve on this group, you can see me at lunch break.

Chuck Sigafoos: Some of you are probably wondering why we're interested in the printing costs and stuff like that. In the reorganization that took place about a year ago in Montana, the printing process was placed in the same organization unit as the carto shop was when it was called the printing and graphics. It is headed up by Rick Kurkness, with me as his assistant. We work together in both the carto and printing area. When it comes down to getting the funding ready, questions have been raised - are we getting the maps for the price we should be getting them and we try and find these answers in hopes of possibly saving some money and getting a few more maps printed in the areas we want. This is one of the concerns voiced by the Montana State Office and at this point I'm still getting answers from some of the states.

We've asked for feedback from other states. Most of the states are printing a few specialty type maps, and the costs are varying considerable from say California to Montana, Arizona, and New Mexico. On these different printing processes and the 1:100,000 we're just trying to answer a few questions about whether we are getting the maps at the best prices available. This is our main interest now. Andy Kordziel is going to be on the committee with me. I'd like to have somebody from the Service Center volunteer to sit in with us who can give us some information there. At this point that's all we have right now. Vic Trilling will be here probably tomorrow to speak on our latest problems.

Ray Thomas: Ed Harne, my partner in crime isn't here yet, so some things I say, he may want to revise a bit. What I've done is prepare a questionnaire that I would like each state office to respond to and provide feedback to Ed or myself sometime this evening. With your input we can establish where each state's program is as far as orthophotoquad coverage.

Each state fits into two categories; you're either in the business of orthophotoquads or you're considering embarking into a program. Some states such as Wyoming, Utah and Nevada already have approximately 100% coverage over their BLM lands. These states are now considering a revision cycle.

For those of you who are in the infant stage as far as orthophotoquad production, I've listed some criteria to consider; i.e., who is going to fund the program? What other state or federal agencies might participate? What type of scanning process do you require?

On the questionnaire, identify what funding activity you know will provide support and list any existing interagency mapping agreements you have or any you are in the process of preparing. If you need help, refer to the Alaska handbook where there are some good examples to use as guides. Identify whether your state has adequate photo coverage and adequate control. Control should be photo identifiable. Identify the type of scanning process you prefer. If scanning is accomplished by the GPM-2, digital elevation model (DEM) data can be acquired at the same time. If scanning is acquired via the OR-1 or Z-2, you will only get an orthophoto product. If you desire DEM's, scanning time is nearly doubled. This means it will double the length of time to receive the product.

Concerning the revision cycle, we've got to determine, how often, who's funding, is there updated imagery, what is the scanning process, should we contract, utilize USGS or prepare in-house?

I would appreciate your input back to me sometime this evening. Thank you.

At this point Wally Crisco made sure that everyone was on a work group who wished to participate.

AGENDA MODIFICATION

Wally Crisco went through the agenda and made the recommended modifications. A copy of the modified agenda is enclosed (Encl. - 2).

AERIAL PHOTOGRAPHY

Jerry Ives moderated the aerial photography session calling upon Paul Rogers to lead discussion on the NHAP program. Paul explained what the needed feedback from state offices was on the camera and film systems for future coverage. He also explained that BLM would probably continue to support the NHAP program at least until a once over coverage is achieved.

Crisco stated that he plans to send out a summary of items discussed at the January 10, 1983 photo coordinators meeting. He will rewrite the aerial photo specifications and circulate them to the state offices for final review. Therefore, this item was deleted from the agenda.

Ives: Lets throw it open for just a general discussion on MMS aerial photography needs.

Paul Rogers: It appears that people at MMS, and correct me if I'm wrong, have specific responsibilities. This person over here has responsibility for this part of the program and another person has this part of it and etc. and they don't necessarily talk to each other. Now that is just our impression and what we have been getting out of Gary Horton and John Hough is that there are some very special requirements that MMS has for aerial photography. They have need of aerial photography on cycles entirely different from ours. We're talking about a five year cycle on our resource photography whereas for MMS we may have a need of a yearly cycle, or a monthly cycle. Another thing we've heard about is that we might have to have some contracts set up in certain areas where we can get the plane out there in a matter of days, at the most.

Like I say that's entirely different and that is one thing that has been bothering us from the Washington office end as well as Service Center. Another thing we don't know is where is your film. I just saw the arrangements there of the MOU that talks about storage at EROS DATA CENTER. We do have a photo lab in DSC that stores quite a bit of the BLM film. With that I'll let you guys start to discuss it.

Bob Schrott: First of all I know where Gary Hortons coming from and I've been at meetings where he has said - yes we have all these uses for aerial photography, station operations, looking for copper welds, pipe lines and Indian lands and we need them for trespass cases. We need them in other cases where we have monuments on Indian lands where we could see just how much material was lined out.

Jerry Ives: We've heard that there is some photogrammetric equipment around in Casper and Albuquerque, which sounds like someone had planned to do things such as Paul talked about like pay quantities and other types of things with precise equipment.

A discussion followed about the equipment and MMS photogrammetric needs. It is too early to speculate on what the needs will be or where the equipment will end up.

Jerry Ives: What's the difference between the geologic mapping that you are doing and the geologic mapping that the Geologic Division of G.S. does?

Bob Schrott: Well it used to be about the same, and of course we'll discuss that tomorrow.

Jerry Ives: I think Jon is probably ready to come up anyway. Anything else on MMS aerial photography? Jon Abrams will address Training and Development.

Jon Abrams: Larry has asked me to announce that there is a hand-out on the back table about aerial photo information retrieval systems. It will supplement what I have to say. I'm going to talk about development first and then Wally is going to pick up on training and aerial photography and if there is time left we'll go through an analysis to see if it is the kind of training you want and if you are getting everything you need. Before I do that I'd like to hand out something that Homer Gilson wants you to consider in the 9671 Cartography Manual. We are writing an Instruction Memo today extending a deadline for the review of the 9671 until March 11th.

Abrams synopsized the Branch of Survey and Mapping Development and what each position was.

He then explained some of the developmental work as follows:

Next I'd like to go into the research development project proposals that we just submitted last week. It doesn't mean it's approved but it will give you an idea of what developmental work we're proposing right now.

The BLM Aerial Photography Information Retrieval System objective is to provide rapid retrieval of BLM aerial photo coverage information to satisfy program needs, public demands, and to reduce storage space. The justification is that it will eliminate manual search of master indexes and then specific indexes as is required now to locate exposures. Right now the turn around time is two to ten days not counting mailing time. What we should have for the public and for the government users is timely service in two to ten days totally. Right now, we are preparing to use digitizing equipment in conjunction with existing Bureau computer systems. What specifically that will be, is to be determined under this RDPP as part of that project. I think you can see from what I put up here earlier about our staff, that we are in desperate need of mapping expertise in our unit if we are going to help you. And that is what we want to do. Wally has been picking up most of the load on anything in mapping and cartography. We feel we need to give you a little better service out of our organization.

Another research development proposal refers to DEM's, and the objective on that is to provide a bank of information about DEM's held by BLM offices and automate the data for easy access. The justification is that DEM's held by one BLM office are known by only that office. You have all seen the Instruction Memo that came out recently asking all of you to respond to us so that we can make a summary and submit it to Washington. I understand that is going to be on a quarterly basis. We recommend the input of DEM data to the Rex 2 at the Service Center. The project is to acquire a list of DEM's from each state. D-410 staff will then put information into the computer. I realize these are very simple statements but if you are interested in actually seeing the DPP, we can get you copies of that. Again they are not approved

yet. They haven't gone to Washington so they are in the proposal stage. The work plan is five work months for D-410 and D-200 in '84. We were instructed by Instruction Memo No. 83-183 from Washington to do this project. I imagine Washington will sign off on it when they get it.

Keating asked if we were looking for assistance from the field offices. Response, we'll be happy to have some assistance, from anybody who would like to get involved with this.

This last one is exciting. Test and evaluation of a photogrammetric technique for coordinates of the PLSS. We are going to evaluate low altitude aerial photography, existing resource aerial photography, image transfer techniques, and analytical techniques for obtaining geodetic coordinates of selected PLSS corners. From that we will be able to compute large numbers of other PLSS coordinates. We are not saying this will be the method, we are just proposing a test on it. As you very well know there has been a great demand for PLSS coordinates for some years. It seems like we are finally getting to the point where we may be generating these in some volume. We recommend tests to evaluate Ultra Light Aircraft and Conventional Aircraft using handheld cameras. Actually this is a composite of more than one proposal. Part of the proposal is to use the low altitude and transfer it to resource photography and also test another method, transfer to high altitude photography. We plan to conduct a small experimental project near DSC.

Those are the only developmental proposals that we have sent in this year. We have an ongoing 10 year development plan which I will talk about more with you tomorrow, but everything that was in the 10 year development plan has been incorporated into the RDPP's that I am showing you now. Any questions at this point. Tethered balloons have been mentioned. And again we are not saying that this is going to be the best method for collecting coordinates.

Jerry Ives: Bruce brought up a good point about field involvement and Jon according to the RDPP cycle I believe that they will be in Bernie's office for review sometime the latter part of March, is that right? If you have any concerns or inputs that you want to make I think that this is the proper time to make them, to Bernie. His staff will be reviewing them in about two or three weeks.

Wally Crisco on Training provided by D-416: I'll make mine pretty short. About three times a year I go down to Phoenix training center and conduct a 1-1/2 day session on photo interpretation. Basically its conducted for the range, lands and realty types and also wildlife biologists. They are beginning professionals. In addition to that I conduct a workshop for the ACSM, which is the American Congress on Surveying and Mapping. Usually once a year they ask me to do this and I'll be conducting one back in Washington, DC on March 15th. In addition to that, I do conduct other workshops such as the one that we just finished in mid January here on the Practical Applications and Use of Aerial Photography which is a two day session. The course content I use at the Phoenix training center and when giving assistance to the field offices such as Fred in Montana, is basically the same. The only thing, down at Phoenix we're working on a compressed time schedule and so we have to

condense it down quite a bit. Consequently we just hit on the highlights of photo interpretations. We have them do some overlay preparations such as vegetation overlays, drainage overlays, land use overlays and then when we go on a field trip, we ask them to check these out for accuracy and for completeness. We go through a few things that I'll just read off to you about course content. We tell them a little bit of the history and background of aerial photography, how it came to evolve and how the uses relate, we hit on the stereoscopy which simply is the ability to see in 3-D or using a stereoscope for the purpose of doing photo interpretation. We touch a little on image displacement, distortion, parallax and we get into the various exercises I mentioned. In addition to that we get into photogeometry measurements, in which we teach the students how to figure the photo scale and area. Then we teach them the techniques for doing interpretation and mapping procedures and show them examples of how this is done and then the students are asked to participate by developing overlays. We use various aids such as stereograms to try to assure that everyone can see 3-d and occasionally I make a mistake by not asking if there is anyone who has only one eye or if they are color-blind. Of course, you can't teach stereo to somebody who has only one eye. If they are color-blind it makes a difference in how they see the various color tones of an aerial photograph and consequently we have some problems. We have to be alert to those types of things. But, we do have a field exercise that we teach them how to use the pace off exercise to develop photo scale when that is the only thing they might have available out in the field. We teach them how to use a dot grid and how it is valuable to them in figuring acreage. We do some other observations in the selected field site area. In general that is what our course content consists of. When we go to a field office like when I provide assistance to Fred, it is about a 3 1/2 day

session. We can condense it down as I have here when we go to Phoenix into a 2 1/2 day session which includes a field trip and a half day on map reading. I have one day for inhouse photo interpretation instruction. Paul Rogers has been assisting and he teaches map reading for half a day and then we have a one day field trip.

Batson suggested that BLM needs a discipline oriented photo interpretation training.

A discussion followed as to who should be involved but no real decision was made. D-416 made a note of this and the suggestion made by Mike Dwyer to develop a course for COAR's on contract administration.

Jon Abrams: We've talked with Lorin Swartz six months ago on the split out of this type of training in remote sensing. I think one reason Wally's course has gone on year after year is it tends to give those trainees what they want to know. There may be a use for a little higher level course somewhere along the line.

Question: Do you propose to conduct training on a regional basis?

We've thought about it in the past, whether to try to put on regional type training and it would just be available to each state office if they call for it. With the experience of the type Wally's had in basic aerial photography, we'd be able to go to any state that requests it.

Wally Crisco: The only thing that would be required if we did not already have a field trip site set up would be one extra trip for that purpose. I still think travel dollar wise it would be less expensive to do that than to ship a lot of attendees from various states into a central location like Phoenix or here.

Andy Kordziel: What are the class size restrictions?

Wally: I don't really restrict it Andy except just physically it is almost impossible to deal with more than thirty people in any given session because we just don't have time to give individual attention to make sure that they can see stereo and learn the other things they are going to need. That is the only criteria.

Jerry Ives: For the last time are there any more questions from anyone? Seems like it is mostly information passed over the last hour or so. I didn't pick up any major issues that we should make an action item of. Does anyone have an issue that they would like to make an action item and to discuss over the next five minutes. The aerial photography I guess isn't a very emotional issue then. Question: What about the National High Altitude Photography program and input regarding camera and film systems for future coverage?

Paul Rogers: I'd like to say if you have anything for the March 21st NHAP meeting, be sure you get it into Cunningham this week because he is putting together a consolidated response to Washington.

Wally Crisco: The next segment of the program agenda is the photolab. I have asked Phil Schryver to moderate that particular session. Phil is the Chief of our photolab at the DSC.

PHOTOLAB

Phil Schryver: For approximately the next thirty minutes I'm going to have two of my staff present the problems, give a brief presentation on service available and the problems that arise in the litho area and mapping by Gary Grimes. The second part I'll have my other lead man, Dick Revette present the problems of color balance in aerial photography. Before Gary comes up to give his presentation I'd like to give the floor to Paul Rogers to say something about the USGS catalog book.

Paul Rogers: Dave Meier had the Eastern Mapping Center make up two copies of this product booklet. We'll leave it out for people to take a look at. And sometime during the course of the workshop let me know if you would like to have a copy for your state office. They cost \$200 a copy. Dave is willing to foot the bill to have one copy made for each state office. The big benefit to this thing is it's got all the products in here. It has an explanation of the product so when you order products from the Geological Survey you can speak the terminology that is needed to make sure you get the right product. So if you are interested in this booklet, let me know. Like I say take a look at it. There will be a follow-up. We've talked about the same type of product for the Service Center photolab or maybe just products from the Service Center.

Editorial Note: WO 720 will program funds next FY for this (if they are available).

Phil Schryver: For the benefit of all new people here, we have a co-op lab with the Forest Service on the Denver Service Center and at present there are eight BLM staff. Larry Cunningham is part of my staff now. His phone number is the same and if you want to call in orders, call Larry at the same phone numbers that are listed on the price list. We house nearly all the aerial photography for all the state offices. We do not have any priority for any of the states. We do work as it comes in. First in, first out. At this time I'd like to have Gary Grimes give his presentation.

Gary Grimes on services available at the photolab.

Products that are produced by the Photo-Lithographic Reproductions Lab at DSC was displayed and discussed. Emphasis was placed on the day light working films which has less silver in the emulsion. This reduces the cost of the film by approximately 15 to 17%. This film has better resolution and the dimensional stability is perfect. This film has to be exposed with a very high intensity light source "le" mercury vapor or pulse xenon, or carbon ark.

Other items that were discussed were peel coats, watercote scribs, color proofs, deep etches, ortho photos half toning, and problems that the lab encountered in the reproduction of materials sent to it. The point was made that you can lose up to 10% in normal reproduction, and even more when the line's are weak or from blue lines which are not photographable.

If anyone has any questions they should call the lab at FTS 8-234-6292 (Phil Schryver, or Gary Grimes).

ENCL. 3-29

Dick Revette summarized some of the problems associated with aerial photo reproduction. He broke it down into 3 categories. The original exposure, duplication of those negatives, and solutions to the problems. He pointed out that some problems exist with the contractor and how the film was exposed, processed and to some extent the camera resolution. The film may have been fogged to some extent, the camera may not have image motion correction, filter problems, emulsion problems (was the same emulsion used throughout the project), was the processing chemistry good, was good quality control exercised. In our case the equipment is 7 years old or older and we have not been able to upgrade it. Finally, each person sees color tones a little different. Dick urged a closer, more critical inspection of the film when it is received from the contractor to try and ensure better quality control.

Keating stated that Wyoming is moving 42 rolls of color negatives to the photolab for storage.

A discussion about updating the lab equipment followed. Hostrop stated that if the states want a more modern lab that can produce more products in less time, they need to communicate that information to WO 720. Crisco pointed out that they should communicate in writing not by phone.

One suggestion for funding the photolab was to establish a working capitol fund.

COOPERATIVE AGREEMENTS/MEMORANDUM OF UNDERSTANDING

Paul Rogers reviewed the Cooperative Agreements and Memorandum of Understanding and handed out copies of the new ones. He stated that MMS

printing can probably be done with these MOU's. We may have to get an inter-agency agreement but that should be all that is necessary. He pointed out that it appears we will have to input all cartographic data to NCIC, and it will require quite a lot of time to implement.

MAPPING

Crisco - This morning we will start out with the 100K program. We combined the review of the 100K program and the 83 schedules and Marilyn Mogg will give that presentation.

100K MAPPING PROGRAM

Marilyn - The 100K program is in its 8th year now, by the end of this year we plan on having 628 maps completed in the entire program. As I mentioned to you yesterday the program changed a little bit this year, we're producing maps at a reduced level from an average of 100-120 maps in the past years to about 66 this year. That aside from the obvious impact of extending the program is causing us a few minor coordination problems. These are things that are not insurmountable, we can definitely continue the program at this rate if we have too. But some of these things should be mentioned. One of the problems in producing at this level is with USGS. We have worked very close with them in the past as they produce what we refer to as the 3B negatives or the base plates for our edition of the maps. They have been making duplicates for us as they complete their series and we buy those duplicates for our series. Because of our past production rate we we're able to receive those negatives from USGS almost as they come off the assembly line from USGS. Because we were funded for producing only 66 maps this year, it has required quite a bit

of coordination. What we had to do is very quickly establish our priorities for the next couple years and decide which 3B's we were going to be able to purchase or we would need to purchase from USGS this year. What USGS has warned us informally about is in the future we may be required to pay a surcharge for producing the extra or for buying the 3B that were not purchasing from USGS as they come off the assembly line. Like I said these are minor problems, but they are going to add to the total cost of the program in the end. As far as production, we're making a few other changes, instead of contracting out our printing, our maps are being printed by USGS in Reston. We're hoping to accomplish a couple of things, first of all I don't think anyone has ever been satisfied with the folding job that's been done by the contractor in the past. Partly it's been our fault, we haven't held the contractor to the specifications that were in the contract when we issued it. There are some questions as to whether the contractor could have handled the folding if we had held them to the specs. USGS of course, is printing their own series and they can and are quite capable of folding the maps in a lot more convenient manner. We're also producing the maps in process colors this year, prior to this we were printing them in PMS colors, which meant that the run was anywhere from 4-7 or 8 colors with processed colors. This year we will be holding the maps to 5 colors, the 4 processed colors plus a PMS brown for the contours.

Q. How does the cost compare between the two?

A. Slightly less this year, coming out to about a dollar a copy which is the figure we always used before.

Based on the first 12 maps that were printed by Pikes Peak last year, we were averaging a dollar a copy. That did not include the 6% GPO charge for shipping. We're paying USGS for a run of about 2,000 copies, a dollar a copy but then that doesn't include the 6% charge or shipping figure either. We're coming out a little bit better. I consider the USGS contract this year an experiment. I'm not really convinced that we couldn't get just as good a deal or just as good products by enlarging our bidding area and going out to a private contractor. But, this is something we're going to check into next year. First of all, we will see how it goes with USGS this year. I'm confident that we're going to get a good product from them.

Q. Does this include copies sent to GS?

Yes this includes the 600 copies that are sent to the distribution centers.

Q. Are the 600 copies sent directly from the printer to GS?

In the past years when Pikes peak handled the contract we had the extra 600 copies printed by Pikes Peak and sent to the distribution centers. So all we're looking at is USGS being our contractor.

Are Geological Survey maps the same as our 100k's?

They produce a topographic edition that doesn't show the surface or mineral status. But the format, folding, and I believe the paper size is the same.

Q. What is the projected completion date for the 100k?

I think originally the program was scheduled to be completed in '87 or '89 I'm not sure exactly what it is, with the reduced production level we project that the program will be completed in 1992. But of course the level of production is still to be determined for future years. Even though Wally has scratched off revision on our agenda I would like to give you an idea of what we're working with in the work group. We've talked to USGS and made an informal contact with them and asked them if they have decided on a revision program yet for their 100K series. They haven't come up with anything formal yet. What they're tossing around is a 6 year revision program. Of course, it would be to our benefit to keep our revision program to a cycle similar to USGS or at least close. There's no point in producing maps or revising our maps if the base information is outdated or hasn't been revised yet. So we're looking at probably a 6 year revision cycle possibly 7 year since our production level is a little bit less than USGS's. We have identified 5 areas that we are going to be looking at to revise, the most obvious is the Surface and Mineral Status Update, the Cadastral Land Grid, also those maps that we have printed in planimetric versions, those that BLM identified as priority areas, and we went ahead and produced, even though USGS had not produced a topographic version. In some cases those topographic editions have been produced since then and we'd like to go ahead and produce our topographic version. Also some states have identified a need for additional information that has to be shown on the base, in some cases this is road information or drain information such as in Oregon. In some of their western areas, they are presently using 30 minute half inch series and they want to go to the 1:100,000. The base data may not be sufficient for their needs and we are going to have to look at ways to bring that base data up for their purposes. The last area of revision is a change to the 30 x 60 format, some states feel

that they would like to see those quads falling close to the state lines (that do not fall on an exact 30 x 60 boundary) added, so that they don't have to look at an extra 100k of a state they have no interest in. They'd like to see us reformat some of those areas for more convenient field use. We're looking into those options. We feel depending on the extra formating or extra base information we do, we're looking at an average of about 1 to 1-1/2 workmonths per map for a revision cycle. A 6 year revision cycle comes out to about 190 maps a year, we will probably have to revise 75% of those. Finally, as far as the impact of automation on the program there are 2 areas in the 100k program that in the first pass coverage could be made much more efficient with automation. The compilation procedure and the scribing procedure. We are far enough into the program that by the time we got automation set up, its help to the final completion of the program would be minimal. At maximum setup I estimate we could save 30 to 40% production time in our 100k first pass production process. Our real savings will be in the revision process, because we are going to be building a data base of land and mineral status which data can be accessed from the states and vice versa. It could cut our revision process in half as far as the resources that we'd have to put into it.

Editorial Note: The subject of digitizing 100k's was discussed. It was stated that we do not have a plan to do it at this time. Dave Meier tried to get a co-op going with aerospace in St. Louis, but they did not want it. It was re-emphasized that if the states desire something to be done at the Service Center, they should speak up now.

Contract labor costs for peeling, expected accuracy, accuracy received and utilization of contracts.

Comments from Bill Glenn

In December we received an Information Memorandum from Washington to cover cost of printing 100k scale maps. This came into our office and was reviewed by others in management. They know that the money to print is coming out of their funds, so they have to analyze it as far as costs, to see if it looks reasonable. Two areas on there (from our standpoint) looked high, one of them was a peeling labor. Why should it be 10%, in our experience we felt it would be less than that. The other area was overhead at 40% which seems high. I've noticed in Marilyn's data which she handed out at her workgroup that the costs had come down a little.

Ives - I don't know where the \$3,000 figure came from. We were talking the other day on this if you can imagine the supervision is 17%. The peeling labor - maybe Marilyn could address that.

Marilyn - First of all those figure's, right now nobody wants to take responsibility for them, nobody knows where they came from, but we put serious thought into reworking them since that time, and the figures which you have are what we think is going to come closest to what's going to happen now. First of all I don't like dealing with the cost associated with the maps in terms of dollars, I prefer to think of it in work months, we're still looking at about 1/2 workmonth for peeling, that does seem high, we researched our working records and those figures bear out. I think alot of the problems are based on historical figures and the maps that we started the program with were very complex maps also we had some little reduction problems, probably the way we were producing our peel coats by burning all the base plates as

well as the status plates on them. So you can imagine how much more difficult it was to peel all the areas, and how much more time was required. The figures have been reduced since then.

Paul - Part of the problem also, Marilyn for the production of 100k's, uses something like 19 subactivities. One subactivity is about \$1,400 a workmonth others are up around \$3,000. So it depends upon what people were charging their time to for that peeling phase as to how much money it ends up.

Will that report be regenerated, the one that's in the memo, so that everyone can get a look at your new figures.

Mogg - Those figures are being compiled by the Washington Office.

Q. Why were those figures sent out anyway?

Rogers - Because Dave Meier wanted to inform you that this is what the Service Center is doing for you or to you. You're all here now, just xerox a copy instead of sending it through another memo. There is an interesting highlight here, we have never been able to figure what the cost of a 100k is. The states have never told us how much they are spending. We would be interested in seeing your figures.

Keating - In looking at these figures, it is a co-op program between the Service Center and the states, clean it up a little bit more looking at the printing money in addition to the compilation funding and identify what it is costing, it might help in selling it back at the Washington level.

Q. Do the states feel that they would like to see these types of summaries like Marilyn did, regardless of the quality of the data?

A. Yes, but needs to be sent out in official memo.

If you're gonna get attention for this program, and build it and give some level of reliability, part of the strategy should be pointing out these things we're talking about. Things have been costing X amount of dollars and we're going to be producing this product now for something less. Make the managers that are concerned about the cost of maps aware that the cost is going down.

PRINTING COSTS AND REGULATIONS

Vic Trilling - I'd like to dispel the rumors that Admin Services is out to gut the mapping program, with the recent memo that came out asking all to identify documents your selling. First of all, back in 1979 the Bureau did a printing and publications study, it was one of the first done in the Bureau. One of the things that the study revealed was that BLM was selling all kinds of documents and were using copyfee account program as their tool. According to government regulations in Title 44 US code this was illegal. The only people sanctioned to sell government document is the government printing office. Most agencies that are cosigned to GPO have to turn the monies over to general treasury. We took the report up to Top management in BLM because the impacts were so severe if we had to stop selling these documents and taking the money and reusing it in the program. Management decided to let the issue die a little bit, until a later time. Four years later and the time of reckoning has come as Dave Meier is well aware. We went out with a memo a month ago,

asking the states to identify the documents that they are selling. One of the areas we are selling heavily is maps in BLM. We are not authorized to sell those maps. What prompted this memo was not administrative services it was a directive from the joint committee on printing, clarifying who can sell and who can't. By 11/1 we are to have a report to the committee identifying these documents. The reason I want to talk to you today is because in this folder I have a compilation that we received from the states, and it looks dismal if we can't continue to sell maps and recoup the money and put it back into the program. Some states are claiming layoffs and some states claim they won't be able to print the maps anymore. Needless to say the budget will have to go up etc. etc. We have a serious problem. The joint committee on printing in its directive, stated that they would be willing to listen to an agency that thought it was unique or had a unique problem.

Top management said they can see what the impact will be, I don't know what will be the outcome, but it looks quite serious. There are some suggestions that we go straight to the hill and have legislation proposed to exempt the BLM in mapping, and allow them to sell their administrative maps, which we are making, recoup the money for BLM and put it back into our programs. We would stand no chance at all for the other types of documents that are sold. Now there's two ways that money is being collected in the bureau for maps, 4920 funds, which is really a nonexistent kind of activity as I was informed by budget and the other is the copyfee account. Neither of those accounts are legal, the copyfee account is strictly used for freedom of information type requests or cadastral survey plats someone might want that you can run on a zerox machine or something like that. Any map that's printed doesn't constitute a copyfee. To make a long story short, we have a very real problem

if the states were at all honest in their responses. We really don't know what to do with it other than have legislation proposed. So this morning I'd like to take the opportunity to field any questions you may have or any suggestions that we can go back to Washington with. We would even be willing after we have a compilation made of the exact impact throughout the states to supply you all with information on a state by state breakdown and what the impacts are going to be. We are looking at some 13 peoples positions in the bureau, that potentially, according to the states, could be furloughed. We are also looking at adding 1 million dollars or more a year to the budget just so we can reprint these maps. A lot of money we're making is going in to print these maps. Counter to the rumor that admin service is trying to gut the mapping program, we are trying to help in this matter and the fact is 4 years later the reality is here and were responding to a congressional directive. Any questions?

Bruce - Posed the question of how the Forest Service handles their sales.

Response: We haved talked to the Forest Service, the Park Service, and Geological Survey, etc. I was at one time, under the impression that Geological Survey was able to take the monies that they collected from the sale of maps and put it back into the program. Absolutely not, the money goes back into the General Treasury. Park Service got a special wavier from the joint committee on printing for their maps and brochures etc. That the money was put back into their program, not so, it goes back into the treasury.

MISCELLANEOUS SUBJECTS ON MAPPING

Editors Note: There was a discussion about the role of the Mapping Sciences Coordinator in the states. The general opinion was that the coordinator was identified primarily for: 1) Point of contact for Aerial Photography, Mapping, and perhaps Remote Sensing; 2) As an information dissemination point; and 3) as an AWP Coordinator.

An Information Memo is coming out of WO 720 to identify who the coordinators are and the mapping advisory committee as well.

Editors Note: There was a discussion on standardizing map prices. Some states are experiencing price variations for the same product. The WO will prepare an instruction memo to standardize prices on all National BLM Mapping program products.

Winemiller: A-76 evaluation, BLM state office approach.

Ray - All states received a memo from Washington, dated 9/8/82, that required offices to provide inventory of Bureau activities, which are covered by the provisions of circulatory A-76. As a general rule the memo stated "a covered activity is any on-going activity that furnishes a regular needed product or service that can be obtained from a commercial source", then it refers to different sections of A-76 to better define the activities. A-76 covers everything from mapping, printing, ADP, to Photolab. We were required to compile information in two categories. Activities that had an annual investment and operating cost under \$100,000 and activities that were over

that amount. In activities with annual operation costs over \$100,000, it appears the Anchorage and Denver photolabs were the only sites affected. Another memo came out in January requesting we identify a planned schedule to accomplish the evaluation tasks. Starting January, six subtasks identified on the attached chart are to be completed in eight months. This involves considerable detail in preparing documentation on contract availability and in-house evaluation of costs. Detailed specifications must be prepared outlining the types of products and expected performances required of a potential contractor. A management review and final decision will result from assessment of in-house operating costs and potential contract costs. It is going to take considerable time and effort to accomplish each task and will have a direct effect on production. Phil might be able to comment on some areas he became concerned with.

Phil - Most important part on the A-76 is getting the information to Commerce Business Daily, and advertising 3 times. It takes between 3 and 4 months to get feedback. Then you have to inspect the facilities to see if they could actually do the work that is requested and can they do it to our specifications.

Ray - FY 84 is the actual time that we will have the evaluation done in Alaska. There is preliminary scheduling to be done this year, but it will be 1984 before we work on the tasks. Contractable items could be mapping, digitizing, orthophoto production, photo rectification work, cartographic work, photolab and printing. Washington, at this time, has only identified the Photolab operation to be evaluated. Apparently they (W.O.) don't consider the other types of mapping operations an issue. Any questions?

Ives - I think we should clarify Service Center, we didn't do A-76 review on our photolab, Forest Service did A-76 on their photolab, but we helped feed some data to Forest Service. They went up to subtask 2, they advertised in the Commerce Business Daily, with an interest announcement, not an invitation to bid.

Ray - The main point I want to make is the effort that is required in preparing the response to the A-76, and alerting the other states who have like capabilities that may be required to go through the same type of evaluation process.

Winemiller - A-16 reply, experience with this years procedures and recommendations for change. Paul will go over this.

Paul - As you all are aware, every year we go through the OMB A-16 circular ritual. The Office of Management and Budget assigned the responsibilities to the Geological Survey to canvas the federal agencies to determine what their mapping needs are. In the past, the Geological Survey has wanted some hand colored graphics, that's fine if all you have to worry about is one state. BLM has to worry about 49 states, so the way the program and BLM has functioned in the past, we (either the Service Center or the Washington Office) send out the Instr. Memo setting up A-16 for the FY. States would do their little hand colored graphics, and send them to the service center, for consolidation into a single response to the Geological Survey. It was taking us 2 workmonths at the Service Center to composite all that stuff that you guys send in to us. We made sure that (especially along the state lines), the quadrangle that overlays between Nevada and Arizona, Nevada and California, and so on, were

the same priority and there were not any duplications with maps that were already in the Geological Survey program. It was costing us more than it was worth. Because, we never got any feedback from Geological Survey as to what made it into the program, until basically we're at the compilation phase and we might or might not get some updated indexes from the Geological Survey. What I was pushing for way back when I was with the Forest Service was automation of A-16, the Forest Service continued with their thrust on this thing and one of the committees called the Interior Digital Policy Committee or something like that is also pushing for automation of A-16. What we're doing this year, is a little different from the past. Have we made it easier or have we made it more difficult? We want you to submit the information in a format so this committee can use our data as we type it up and test the program, to see if its going to work. Do you think its a good idea or do you want to go back to handcolored graphics or what. One of the concerns is tracking what you requested last year or the year before. An automated system may help a lot.

Thats one thing we are looking at, and getting some feedback. I don't know how many of you have ever heard, when you did last years program, what made it into the program. That's one of our biggest complaints, the manual method that the Geological Survey has insisted on using takes so long that we never know whats in there.

We don't know what Wohls committee is coming up with on data submissions. We are hoping that in the future, maybe you can type this up on a word processor, and send the floppy disk in. I mentioned to Bruce Keatings workgroup last night that we now have access to the Geological Survey computer system. We

have the interagency agreements signed off on. So what we're looking at there is for you to send the stuff into Denver, then we take it over to the Rocky Mountain Mapping Center and submit it to Geological Survey through their computer.

My feeling is that all we have to do is identify the scale, type of product we want whether it be DEM, DLG, 7 1/2 minute or 250, give it the file number that's in the lower right hand corner and a priority and that should be all the information that we need to submit. You don't have to indicate the longitude and latitude? The file no. is the lat, long. in the Southeast corner of the quad. So if you give it 7.5 or 30 x 60, the computer should already know what product your requesting.

Some of our state offices in the past have not only submitted the color graphics, they have also submitted the listing. Some of you guys were duplicating the procedure originally.

Yes, this year they did change the game plan on us a little bit. If you want a revision to a 7 1/2, you have to say what revision.

The 24,000 the initial coverage of the lower 48 states on the 7 1/2' quads, they don't even want to know anything about it. They've established their schedule. Now if you want a coop, I'm sure they will be willing to listen to you and take your money.

Someone posed the question about working with State mapping advisory committees.

As long as you brought that up, those advisory committees are not throughout the lower 48 states. Pat Webb for example, if they had it for Eastern States would be spending most of her time, traveling to those meetings. If you can do a little coordination like Dave Meier did on the high altitude program you can get more than 1 vote for some of these quads, then you stand a much better chance of getting it into the program. You can do this by this advisory committee or work with other agencies to see if you can get more than one vote for some of these maps. This year's A-16 is a little different in that we've acquired MMS requirements, so they are going to be submitting. The single biggest thing that the Service Center has to straighten out is, priorities.

Question: Bob aren't some of your requirements statutory in nature?

Most of our map needs priority wise are based on on-going programs.

Rogers: What I'd like is some suggestions either by electronic mail or by phone to the Washington office and let me know what you think as far as ways to improve it. In the Bureau we're wasting too much time and effort on something that many feel is not even needed. Its paying off though. All of a sudden these last few years we're starting to see priority maps coming in and we're not funding some of them.

Crisco - I remember the Colorado mapping advisory committee, they needed to get a couple of maps over in the southwest part of the state completed which would give complete coverage for Colorado and they asked if we would support their priority requirement to get that done. I talked to Greene (this was before Marilyn came on board) and by us more or less endorsing their priority, they got those maps scheduled and we got the feedback on it.

Rogers: A-16 does work especially if you do a little horsetrading with FS or Soil Conservation Service, etc., where you can get some support and give some support for their quads, you can get those votes necessary to get it into the program.

This is kind of aside to A-16, the work for the Mapping Centers is not scheduled on a yearly basis and the GS has asked me to ask you because they're getting ready to send the next allocations to the mapping centers. Do you have any high priority items that are needed and to your knowledge have not been allocated, if you do see me later.

Editors Note: There was additional discussion about the need for feedback from GS as to what made it into the program.

Rogers: So we can move on from A-16, I'm going to ask you when you get done with A-16, drop me a note, send it back to 720. If I don't hear from you by the time the consolidated report from the SC shows up, you will get an electronic mail message.

The design of maps that will serve BLM Managers and the public was discussed and Bill Glenn pointed out that the 100k maps don't have alot of data on them that managers need. Some state agencies are adding data to them which our Managers need and the public would like to have. He said that they had tried to solicit input from the Districts as to the information they need.

Ives suggested that the way to handle this, is the comments on the draft cartographic manual. If the states want more flexibility to show different things they can submit those comments and a committee can review and modify the manual accordingly.

Hostrop stated that we really do need to review the standards with GS. He also stated that an overprint of the 100k is possible.

Summary: The states are to consolidate all the input from the districts and submit to WO 720 for review.

MMS Mapping needs was discussed and Bob Schrott reviewed the MMS mapping program, gave hand-outs listing the kinds of map products they make such as, Geologic maps, and Leasable minerals and waterpower land classification maps. Some of the maps produced are for internal use but most are available to the public. They do have proprietary data and as such they need security procedures followed in those instances. MMS has concentrated on high interest areas such as Coal areas. Bob was concerned if the BLM/GS agreement for printing also would include the MMS needs. We feel it will but Rogers can confirm with GS when he is back on detail. Rogers, Mogg and Dwyer will follow-up to coordinate the MMS needs in March 1983, as a WO detail to merge the MMS and the BLM Mapping program needs.

Bob pointed out the need of a Central Control for review and printing of certain maps, e.g., Leasable Minerals, Geologic Maps, etc. He emphasized some of the dangers if central control is not exercised -- such as incorrect data being published and may have to be recalled.

He wants to see the Leasable Minerals and Waterpower land classification maps continued. Possibly as a third 100k series. Rogers, Mogg, and Dwyer will follow up on this during March with the other coordination efforts.

AUTOMATED CARTOGRAPHY

Bruce Keating summarized the topic Automated Cartography to conserve time as most of the agenda items were assigned for work group activity and are covered in the Automated Cartography work group recommendations.

Bruce showed slides of the Wyoming State Office equipment, and explained past and present procedures for collecting and processing data. He showed examples: of slope maps made from DEM data; cartographic output products; digitized plot of coal beds and explained some of the problems they had reconciling the data to maintain quality control.

Jerry Edler gave a presentation on Automated Land and Mineral Record System (ALMRS).

Training and Mapping Development was presented by Jon Abrams in the following presentation.

Jon Abrams: I'm going to show you an example of how we formatted this ten year development plan. Mapping proposals for digital surface and subsurface ownership maps is the RDPP that I have just shown you. Another one is the thematic map design. The highlights of that are to use an interactive process via colorgraphics terminal for color and pattern design. Advanced plotting

techniques bypass present manual processes for map compilations by using digital data; state-of-the-art techniques, and automated drafting, scribing and photo plotting. These are written up in a little bit more detail on the example I'm going to show you in a little while. I just wanted to highlight the central idea for you.

We would like to have as many of these ten year developments as we can get because we are really gathering ideas. So if anybody would care to write one up sometime and send it to us we would certainly have a lot of interest in seeing it. We're not in the final stages on this by any means and we did try to get state office involvement in preparing these. The reason that we didn't have people from outside was because of the travel money and how quick we had to put this together. We had about 29 ten year development plan proposals altogether but most of them were in surveying. I might mention that Pat Webb is the chairman of the work group commission for the cadastral survey meeting we'll have next week. We don't know what the results will be but that's why we are asking for input. We want your ideas. Next I'm going to show you what one of these looks like. This is strictly a locally generated form. We approached this with a couple different philosophies. One was to have only one page. You may have a fifteen volume project but we wanted the idea compressed into one page. Second, we're going to the field and asking the field to prioritize these. Once these are put in priority, and we have pretty much of a consensus that we ought to go ahead with them, then we will do the RDPPs. Those will be the more extensive documents where you really have to justify and put out a work plan and outline just exactly how you are going to handle that particular project. I've got some more examples of these but I think that with the highlights I've given you that is probably all you want to know on this. Are there any questions on this ten year development plan?

I would like to go into training needs.

There was a meeting in Marana last June in which several key people, key mappers, met down in Marana to come up with a draft for the carto manual. We asked that group to identify some training needs for mapping. Now in talking to people this last year every cartographer, every photogrammatrist, and everybody I've run into who is in the field professionally, has said we don't have any training and we need some. We'll probably have to develop these training courses in '84. The group came up with introduction to automated cartography systems. The meat of it was there is a lack of knowledge of state-of-the art hardware/software applications and new automated cartographic systems. Employees have not been provided the opportunity to see state-of-the art applications of automated systems as they have been applied to BLM programs. Target groups include Division Chiefs, state and DSC cartographic and photogrammetric coordinators and others in responsible charge of cartographic programs.

That was the first course that was proposed. Automated cartography system operator orientation. This course would actually train employees of the state that has just purchased a new system based on the introduction to automated cartographics systems.

No. 3, Advanced Cartographic Techniques is proposed as a coop course with USFS and USGS to be held in Marana. There is a lack of knowledge of state-of-the art cartographic products and procedures within Bureau offices and with FS and GS. Reasons, government studies showing lack of standardization, MOUs between the three agencies, confusion of variations between government agencies' cartographic products. Objectives, reduce the number of user inquiries by increasing the quality of cartographic products.

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The number of inquiries will be documented on a monthly basis. Exchange technology between agencies and offices thus providing standardization. Increase Exposure to New Technology. That was another one of the courses that was proposed.

The target group on this would be 1370 Cartographers, 1371 Cartographic Technicians, Individual Information Specialists. I would like to get the feeling from people who were involved in setting this up last June, if you still feel the same or if there is another direction we should take. I'll ask the group that question. I'll put it another way. Do these three courses look like they are good courses to have and go ahead with. Would these courses as I've read them off to you satisfy the mapping needs that we have in the Bureau. Is there anything they would not satisfy. Of course when you say you are going into automated cartography it is almost a necessity that you have to have some kind of training.

Audio Visual Programs: We have twelve audio visual programs that have been produced by the staff, and are self-paced slide tapes on dual projectors. We thought at first that when we did these audio visuals that they were going to have to stay basic but now we have gotten into more of the advanced type programs. It certainly is a good technique for background and it sure does save a lot of money. The National Audio Visual Center handles all of our slide tape programs and I understand just from talking with them a couple weeks ago, that they have sold about 1,000 of those to the public, state governments and whoever. Is the self-paced audio visual slide tape program appropriate for mapping? Would it do any good in the offices that you are in. Just too few people there? If everybody is okay with it we can go ahead and develop these three courses that I've just been talking about? Does anybody here have any objections to any of them?

Bernie: Would the target group be professionals in the resource area or what?

Jon Abrams: They certainly could be included. At one time we were proposing a non-professional map reading audio visual type program. I've talked to quite a few people in the state offices outside of cadastral and mapping. They have to teach their people how to use maps quite frequently. We did have that in one of our AWPs but it wasn't high enough to be considered. I'm going away from here saying the three courses that I put up here is fine with everybody. We haven't tried to edit anything on the ten year developments. That's the stage we're in, very preliminary. Refinements will come later if they are in fact approved by the general population in the mapping and surveying community.

FUNDING

Butch Hayes: Again, I appreciate being here to talk with you. I'll say a little something right off the bat. For a long time I was in Resources at the field level and still am in Resources. People always accused us of using too many acronyms, the URAS and MFPS and AMPS but you got even this week. I feel like I need an authorized abbreviation and brevity code to work with this outfit. Bernie, your answer to the MMS funding - you might have it by the time you get home because they are justifying it today and tomorrow.

A little bit of a given before we start. As most of you may know, in '82, although I don't have the figures for the whole mapping function at the Service Center, I can speak pretty good about the 1:100,000 mapping effort. We had about an \$800,000 base at the Service Center. In fiscal '83 that was

reduced to about \$500,000. But in '83 we made a couple of rules and the \$300,000 was redistributed to the states. The difference between the fiscal '82 and fiscal '83, was the feeling at the Washington level, and my deputy especially, that he didn't want to buy maps for the states. He was willing to make the capability available at the Service Center, but he didn't really want to force them on the states. He felt that it is the State Director's prerogative to order maps. So in '83 the theory at the beginning of the fiscal year was there would be no workmonths charged against the states. It turned out not to be quite that way. We are going to fix that at mid-year. The feeling in the headquarters office is that if that money is going to end up paying Service Center salaries then we are going to adjust the base of the states up front and give it to the Service Center. With the new FTE game as opposed to the old head count, it really messes up the states operations when workmonths and FTE are getting confused through the "Pay/Pers" system.

Wally Crisco: Will it include the cost for maintaining the equipment the Service Center has, or is that a separate fund or what?

Butch Hayes: Thats one of the questions that I have on the next sheet. I don't have the answer to that yet.

Bruce Keating: How will it take place and how will that transfer?

Butch Hayes: We'll get to that too. I want to try to bring you up to where we are now. Looking at '84 the commitment that the Washington office intends to make in terms of the capability of the Service Center is to fully fund these three capabilities: cartographic mapping, photogrammetry and the photo

lab. The idea is to maintain the capability at the Service Center for the states to come and acquire the services they need for the 100,000 effort, the photo lab and photogrammetry. I can't talk exact dollars to you today, but we have some rough figures. I've been working closely with Marilyn and Phil and my friend Paul here, but until I go back to the Washington Office and present the figures, I'm not telling them to you here. Now there is a catch if this is going to work. If we are going to be able to fund the capability of the Service Center, it is going to be based on information coming back from the states. We must have at preliminary work plan time a reliable estimate of the state support needs. I think you are going to see the trend in the future that the mid-year give and take and up and down is going to get less and less. I think as the responsibility for budget goes more and more to the State Director that you are going to have to get some very reliable estimates up front.

Harold Martin: What you're hitting at here, I think is a crucial problem and I assume when you came up with this that you looked at the possibility of No. 1 we're saying, yes, we need that capability at the Service Center. What about if the only things that come off the top are the W/M's for people and money to maintain the equipment that they have. The states needing support will pickup the supplies and things like that. By pulling that off the top it might get you away from this problem in No. 2 which I don't think you are going to get, because we can't get that information in the state in time for those guys to plug it in. It's a problem in the state again, if it went the other way they wouldn't really have to know the total support program because the manmonths to be funded and their equipment will be taken care of.

Butch Hayes: Any procurement items, even for these three elements are still going to be charged against the states.

Bruce Keating: Aren't you doing No. 2 like for engineering now?

Harold Martin: Here is the problem. We have to identify in the state the total support that the districts and resource areas need and when we get that put together, then we can determine what we are going to have to call on the Service Center for. But that information isn't put together until after the time the Service Center needs it for programming purposes.

Butch Hayes: I don't think it is as big a problem as you perceive it to be because I'm not trying to show you the way its been. The way we're looking at this thing is to fully fund the Bureau mapping capability at the Service Center. Capability, not just the 100K, but the full mapping capability. The special order items, the aerial photos, the strip maps, the other things you guys have been talking about all week. If we know what the states needs would be, we can fund the Service Center to meet that need. Marilyn has laid out an array of different capabilities and funding levels for me. She said okay, we can continue with the 100,000 the way we've been going; we can automate; or we can increase it back to the 100 maps per year, the original target. Those are things that I can't tell you today cause I've got to go back and get some more input. But when it is done it will be like a mail order house. We'll fund the Service Center for a base level of capability including equipment, supplies, film, and whatever. When you order it you pay to replace their stuff. That's what you will be doing. Not workmonths, but procurement.

Ives: Are you using two to make a determination on reduction of cost target for each of the states?

Butch Hayes: Yes, for workmonth charges. Because they are not going to let you charge back. And like I said in the future this mid-year execise where we just say, "well go ahead and we'll fix it at mid-year," is not going to be, at least I hope not. I have gone through three midyears so far. The first one was unbelievable, and the second one, maybe I got used to it, and last time I thought it was pretty good. But in order to get real good you have to be able to do some legitimate forcasting.

Paul Rogers: One thing that was proposed one time was that the Service Center turn in their AWP about two weeks after the states get theirs done. I don't know if that's at all feasible, but I think that would solve part of the problem that Harold is talking about where you get it right there at the tail end of their cycle.

Harold Martin: If you pull everything that I'm reading into No. 2 it won't solve it at all unless they go back and readjust the allocation for the states. It goes deeper than man months and equipment.

Bernie: There is a mechanical step in there Harold that just doesn't appear right so far as the graphic and that is that we give the states their advises. For example, let's assume under the 100K the planned capacity is 90 quads. And every state is given a target that's based on what the status diagrams calls for. This is coordinated through all the major resources and

upland minerals in Washington before it goes out. That should warn you as to what you are going to have to do for No. 2. Thats where the problem lies with that, that's the way we have done it in the past.

Editorial Note: There was extensive discussion about funding problems, etc. to which Butch made the following comment.

Butch Hayes: I've taken some pretty detailed notes on that problem as it was described here today and I'll sure make people aware of it when I get back there.

Harold Martin: Why I'm confused is, I don't understand what you are talking about, the A, I don't have a problem with.

Butch Hayes: As I understand the mapping function at the Service Center it is a composite of inputs from these two certainly into here but these two then into other products that you guys order every year too. Okay and we are trying to get away from the workmonth aspect of the support. Like if you want to support service we are going to look at it like a mail order catalog. Thats the idea, as opposed to 25 for the map and a 150 for the guy to make it.

Bernie: Phil do you have a historical record of approximately how much aerial photo products are ordered by state.

Yes

Bernie: Does that information go out in the PAWP?

Yes it is provided to the states from the Service Center.

Butch Hayes: I'll talk to you a little bit more on the next sheet about how we are going to get the funding.

Jerry Ives: On No. 1, we have A, which is a product of 100K maps. B, and C, are basically organizational units. I think it would be better if A would be cartography and it would include the state maps, the 100,000 and the other things that the states ask for now and then.

Butch Hayes: Then I'll just add a couple more things and then at the end put in parenthesis (cartography). We can do it that way.

Paul Rogers: Jerry, we went back three years when we put together some of the funding things here and historically its 70 workmonths of support for the state offices isn't it? That's the average over three years. There isn't a state that is not included in there by the way.

Jerry Ives: It is 70 workmonths for Phil's shop. There is an average over three years.

Paul Rogers: Average over three years is 70 workmonths of support by the Service Center in all three units of all the state offices. Exclusive of the 100K and riparian.

Bruce Keating: We have 10,000 photos we are estimating to be printed next year, '84. I take Phil's figure of 1.30 each and put it in my procurement

plan. Then have a unit cost identified by the Service Center, and then I could make up my mind whether that is too much or not, and if I wanted to go to contract or not.

Butch Hayes: In '84 you could, but if these guys sit there for eight months in '84 waiting for a job to come in, they won't be there in '85.

Bruce Keating: I realize that. I mean there is a little play back and forth here in what you are getting in the way of service. The same way with photogrammetry, that is a little bit hard. We may have a hard time identifying how many miles of road we will have.

Butch Hayes: Well, I'm just not into your field enough to tell you how to quantify what these output units are going to be. I flat don't know. I'm relying on you guys to provide that input.

Bruce Keating: Well, we are going to be getting some of those estimates from the Service Center, from Paul or someone.

Bernie: The first thing the Service Center should tell you is the plant capacity with each package.

Wally Crisco: You know the main thing that I think is important to realize here in the area of photogrammetry is that you just can't order photogrammetry in to existence every time you happen to need it. You've got to have the capability in existence before you need the products from it.

Bruce Keating: Your vehicle should give us what we have done in the past in photogrammetry then we can put a minimum base support in for that.

Martin: Is it possible to delay the Service Center's Annual Work Plan until after ours is done?

Hayes: That may be the answer, I don't know. The budget shop bought off on this concept, in fact they suggested it. For a mechanism of getting it done that sure might be a way to go.

Why don't you let me run through this thing and then we can talk about the individual elements. I wanted to give you the theory of where we are trying to come from and what we have to decide at the Washington level. Marilyn helped me with the way she has laid out the cartographic scenario of the options that might be available for the 100,000 series. She has shown me a dollar amount based on completing the initial effort and even into the revision stage. She said okay it will cost us XX to go on the way we are going, it will cost us XX to try to automate, it will cost us XX plus if we try to go into equipment which would be through automation and the whole shot. Now what I have to do is go back to the Washington office and look at funding this thing, and try to get to the benefiting activities, that mysterious thing in the sky. What we envisioned in the budget shop was to make a surcharge right up front. Once we decide on a dollar amount against all the appropriated funds in the Bureau, exclusive of emergency funds. If we decide on an equitable proration of, say, forestry, local and O & C and non-O & C of lets say a total dollar amount based on the level of capability they want to provide in B. We might need a million bucks. We decided that

forestry's fair share would be 50,000. Make that a percentage. In theory once that percentage is agreed upon by the deputies, that percentage stays. The ups and downs of the individual MLR accounts could change over the years, but the percentage will stay the same. So if it is a fat year you kick in more, if it is a lean year you don't kick in as much. We are recreating a sort of 4800 account, but I don't know how else to do it. Because this is going to be a tough nut to crack to get everybody to agree to it back there. I don't want to do it every year if I can help it. That's the benefit of a stable percentage charge against each subactivity.

Bruce Keating: We are doing something equivalent like that in the states now on cartography but it varies a little more than that between activities.

Butch Hayes: I'm not sure about pre-suppression money, but we'll see. Marilyn helped me work those out. There are a few discrepancies in our initial cut. We had range improvements in there and I don't think we can do that. We might have to rework some of those, but in theory I think it is a good approach. I think it is a way to do a couple of things.

Keating: How does this resolve conflict between states. Your priority needs between Wyoming versus Montana. When you look at the priority and the workload capacity something has to be broken down to get a base to start with.

Bernie: Well lets go back to a simple example I gave of 90 quads allocated out based on the status as it is today. That means maybe for Wyoming when they have 40% of this first priority jobs scheduled and for '85 it might work out to only 30%. Some other state would have a higher percentage. I just couldn't say that everybody's first priority would be met every year.

Butch Hayes: Nobody is going to be first in line every year that's for sure.

That is the beauty of it, we are not going to get any very different subactivities when the MMS merger is finalized. It's going to be monies going into mostly different existing accounts. So it really shouldn't make any difference.

Jerry Ives: We do have one mechanical problem in the photo lab. One of the reasons we can offer the price breaks we do is because we get a price break on materials ordered in the bulk, and some of those materials have to be ordered 90 to 120 days in advance. Do we buy supplies now on a job basis or not?

Butch Hayes: He's paying for them on a job basis, you are buying them on a production basis. I think it might be a little bit of a paperwork nightmare. You might have to go to a procurement plan with 30 line items that make up the component parts of the funding. It is just going to be harder on whoever is writing up the order I think, because the states aren't paying for it out of their procurement plan.

Jerry Ives: We are buying supplies, how do we know who to charge a 120 days or more before we get the order. That may not be the problem with the photo lab.

Bruce Keating: Say the photos are \$1.30 a print, does that cover all cost including personnel costs? How does that money get distributed in the Service Center. If I put a procurement line item in and I have 10,000 prints and I put the dollar value back in there, its more than just supplies.

Butch Hayes: I can tell you the overhead won't be a part of it and you are going to get a new price list. I don't know how they do procurement in the Service Center, you must be involved in the same dilemma right now with different procurements that are paid for by the states. In the other aspect to that, the answer might be as simple as, if my theory works out, you'll have a base capability of supplies; at the end of the year you refurbish for starting the new years work.

Butch Hayes: I hate to put this up here, it's just something that could happen when we go roaring back there with this approach. If what we consider to be an equitable basis for corelation of charges against benefiting subactivities doesn't work then somehow they are going to have to come to an agreement on who is benefiting and how much.

Question: How will this work, will different percentages be allocated to the subactivities in each state, and the end results be a 2%/8% Bureauwide figuring each state would use the same.

Butch Hayes: When it was first brought up in Washington, budget said Dave Meier may have to do workload analysis with mapping function in DSC.

Paul Rogers: Isn't Roz and crew doing that as part of that management review or whatever they call it.

Butch Hayes: She may be and that's great. Maybe it is already done. When I talked about the surcharge against the subactivities Marilyn worked up a kind of plan that looks really good to me and we both agree that it might be too simple to work but we just took the total Bureau budget for MLR. Then the

allocations by subactivity, divided it in reverse and got a flat percentage. The spread was 5 to 13 percent. A lot of them were down about 1%, but that was the first cut and first approach.

Question: What are these historical data the Service Center has. Is that by subactivity or is it just by states.

By state.

Butch Hayes: I think you need to take a message home to your states. If the mapping function in the Bureau is to continue at the level we have or better it is going to take participation on the part of each state. I know you have participated in most states but there are a few that have not. You are going to have to stay involved if you want the product.

Bruce Keating: Politically why don't you take our proposal and put it all in one great big nest egg, put it under one special activity like another 4800 for cartography. It gets that State Director some management flexibility.

Butch Hayes: Where I have a little bit of a problem with it is when you talk about this kind of thing in one activity. I have yet to see range pay for a map and nobody else use it. I don't know where these benefiting activities comes in. It will have to be decided a little higher than me. The first thing you are going to hear about your involvement is when the directives come out for the annual work plan.

Editorial Note: Much discussion followed about various ways of programming to support base capability for cartography, photogrammetry, and the photo lab at the Service Center.

The idea of a regional organizational set up was discussed. The idea advanced was that when one state, e.g. Alaska, has capability that other states might be able to use, why not program funds to have Alaska do the work instead of programming funds to develop the capability in the other states. It was pointed out that several states are equipped or they are trying to get equipped to do such things as photogrammetric mapping, photo lab work, etc. It was pointed out that this duplication of effort, should it be carried out Bureauwide would be a gross waste of money and equipment.

Editorial Note: The present and future budget outlook for aerial photography programs was discussed. It was pointed out that funding support for the Bureau cyclic photo coverage program has been severely cut and the program is in serious jeopardy because of it. Some states seem to get funding but the majority does not. It makes it difficult to cooperate or coordinate with other agencies unless you have a plan you can use to show them.

Butch agreed to bring up the problem to the Directorate and then the Director can mention it to the State Directors at their next meeting. Bernie also made note of the problem for his action.

Crisco stated that his main concern was that the cyclic photo coverage plan for BLM is going down the tubes rapidly. He's concerned that BLM's going to get back to the same situation that was existant when he came into the aerial photography end of the BLM program. BLM had no aerial photography program and the only people that ever saw one was somebody who happened to run across a photo in a file and they may have punched a hole in it and called it a section

corner or something like that. He pointed out that we cannot afford to hire enough people to crawl all over the face of the earth trying to get the kind of data that is needed to manage the lands properly and that aerial photography is one of the best if not the best tool that they can have. If we don't keep the program alive it's going to die. Just plain and simple.

Question: Has the cyclic plan been included in the Manual?

It's not a manualized thing. It has been sent out to all states, it was developed in cooperation with all of the coordinators in the various states, when we had them.

Paul Rogers: There was supposed to be directed through the AWP that the next sections of that manual be worked on. The cartography one is just a start. Then there is supposed to be aerial photography, photogrammetry, geodesy. I think it has been put on hold.

Jon Abrams: It has been put on hold temporarily because the person who had been assigned the lead is on detail to OCS full time. I think we may be able to get back to it possibly in March or so by rearranging some things. Because it is in the AWP I think we have to do it anyway we can.

Bernie asked how many states were following the cyclic plan fairly close. Most said they were following the plan but could not maintain the cycle due to lack of funding.

Wally Crisco: We have some pretty live and well states and then we have more than half that aren't still alive and well. It is a problem and it concerns me and it is one we ought to devote some attention to in all of the states. The people who are here as Butch said, have to remain involved in the mapping program as far as budget is concerned. They also have to be involved with aerial photography. This is supposed to be a mapping and aerial photography workshop. Get in there and pitch.

Wally Crisco: If you have additional thoughts on funding that you wanted to ask Butch about, he will be here pretty soon. Meanwhile, Paul Rogers and I kinda developed a miscellaneous item for discussion. Anything you feel like should be discussed I think we ought to cover in this. I've already been requested to bring up the subject of organizational structure in where cartography is located in the various state offices, the Service Center being included as well. Ray Thomas was expressing a little bit of concern about that. We touched on the subject briefly in our previous discussions, but never to the point where we had any recommendations coming forth from this group. Perhaps it is appropriate that we express our opinions at least with regards to where it is located because some of the states have our people placed in information systems and some of the equipment is placed under information systems that we rely on as cartographic support equipment. Other types of equipment such as drafting tables and the like, they don't want to have anything to do with it in information systems. I feel like you folks who are working with the equipment and represent all the states might have some valuable input that maybe Butch could take back to Washington as recommendations for organizational set-up from this group anyway. Now's the time to speak your piece.

Summary of discussion:

Most of the states appeared to be in agreement that equipment dedicated to mapping (cartographic or photogrammetric) whether it has a mini computer attached or not, has no business being under Information Systems.

It was pointed out that the Mapping Program was organizationally located in various places in the state offices and that creates a problem with budgeting and communications. Rogers pointed out that the appointment of Mapping Sciences Coordinators was intended to help this situation.

Also, I think it was generally agreed that mapping and aerial photography should be located under operations.

Rogers stated that Bernie is prepared to go to bat and make something out of the Mapping Program if he can get the proper input from the field offices. Thomas pointed out that much of his operation is Secretarial Mandated and some are tied to the MBO.

PHOTOGRAMMETRY

Rogers summarized photogrammetry and pointed out that we at DSC are using some antiquated equipment and some relatively new. We have not been able to get management support to purchase new equipment. He also pointed out the lack of funding for photogrammetry.

MISCELLANEOUS TOPICS

Rogers discussed the need for a parcel identifier and presented the Georgetown ortho photo quad. He asked if we need ortho capability at the Service Center. Much discussion followed. Some said yes, some no. DSC will prepare a memo for W.O. approval to poll states as to need.

Bill Glenn presented his thoughts on the 4920 funds and why it was suggested as an agenda item. Oregon was experiencing situations where map stock had been allowed to run out, they had been told they couldn't use the 4920 funds to reprint and replenish those items. Since then they have been allowed to use them and they are proceeding to have some maps reprinted.

In some cases salaries may be affected by the 4920 funds. Maybe the issue has been resolved at least temporarily. Vic Trilling said continue business as usual until notified otherwise.

Crisco reviewed the action items and recommendations with the attendees to be sure none were overlooked.

Taddia pointed out some problems caused by various field offices selling the same product for different prices. WO-720 will prepare a memo standardizing prices for all National Mapping program products.

A recommendation was made to put cartography, photogrammetry, and aerial photography under one division in the state offices. The general concensus was the Division of Operations. Of course, to have our own identity would be preferable but up to this time the climate has not been favorable.

Thomas recommended we explore or consider having interoffice agreements. Pointing out that we can get things done through interagency agreements and why not within BLM. The editor agrees -- it is a sad thing when we can not transfer funds from one SO to another or to the Service Center to get a service performed that is needed.

Marilyn explained via vugraphs her work group's recommendations. Later she had all the recommendations, etc. typed and they are included in this report under 100K revision plans report.

Editor: There was a lengthy discussion on ortho photo requirements. Crisco stated that each state should re-evaluate their present requirements with G.S. and reprioritize them if needed. Subsequent to the workshop -- Crisco found out that G.S. has capability of producing more orthos than they have requests for. That was directly opposite to what was understood before.

Mike Dwyer introduced his work group and presented their recommendations for a standard transportation map. A report is included with these minutes. An action item to rewrite the 9110 Manual section which deals with transportation was brought out and Mike Dwyer accepted the lead for that item.

Chuck Sigafoos presented his work group and the recommendations for printing costs and regulations. Their report is also included in these minutes. They will conduct a comparison contract to ascertain if we are getting our printing bucks worth and Sigafoos will distribute the results -- Bureauwide.

Crisco reviewed the action items and recommendations again. A copy of the final action items and recommendations are included herewith.



United States Department of the Interior

9670 (720)

BUREAU OF LAND MANAGEMENT WASHINGTON, D.C. 20240

LIB
April 20, 1983

Instruction Memorandum No. 83-478
Expires 9/30/84

To: SD; SCD; BLM D-BIFC

From: Director

Subject: Mapping and Aerial Photography Workshop (February 22-25)
Action Items and Recommendations FD 5/16/83
5/27/83

D-100
D-120
D-130
D-140
D-200
D-220
D-240
D-250
D-280
D-300
D-410
D-420
D-440
D-470
D-480
D-490
D-500
D-510
D-520
D-530
D-540
US
RF

Numerous items that will affect all Bureau offices and most subactivities were discussed at the Mapping and Aerial Photography Workshop held in Denver. As a result of the excellent participation, it was possible to resolve many issues and determine guidelines for upcoming programs. A full set of minutes will be forwarded shortly.

Actions assigned for followup:

1. Guidelines for Storage: Issue an Instruction Memorandum to clarify the quantity and procedure for the storage and distribution of reprinted 100k maps Denver Service Center (DSC)).
2. Standard Prices for Maps: Prepare guidelines for charges on products that are a part of a National Mapping Program (Washington Office (WO)).
3. 100k Changes: Poll the States on changes they feel are necessary to the current series in order to facilitate their use in the field (WO).
4. Survey and Mapping Sciences Functional Statement: Prepare a memorandum for review by the States which defines the parameters of the surveying and mapping function (DSC).
5. Copy Fee Account: Prepare a recommendation to be forwarded to the Budget Office concerning the use of 4920 funds (Wyoming (WY)).
6. Need for Orthophoto Capability: Prepare a questionnaire for WO approval and distribution to State Offices in order to determine the need for an orthophoto capability in the Lower 48 States (DSC).
7. Model Position Description: From input received from the State Offices, a model position description will be prepared that describes the duties related to an automated cartographic position (DSC).

Annex 4-1

8. Technology Problems: Prepare an Issue Paper on the internal coordination problems associated with technology related to automated cartography and geographic information systems (WY lead (DSC and Colorado (CO)).
9. Orthophoto Requirements: Each State will evaluate its orthophoto requirements and priorities and submit these to the Service Center (D-416) for consolidation. A consolidated response will be forwarded to the U.S. Geological Survey (USGS) in response to their inquiry.
10. The Bureau of Land Management Transportation Manual Section: Obtain from the WO Division of Engineering a redefinition or clarification of the Transportation System Manual Section and disseminate the information to all Workshop attendees (CO).
11. Printing Costs Comparison: Conduct a comparison of contract cost for the printing of 1:100,000 scale maps and distribute results to all workshop attendees within 30 days after printing.

Action item No. 9 is an action for all States and a response is to be sent to the Service Center Director (D-416) by May 27, 1983. Should you have no requirements, you should so indicate in your letter. Action item No. 11 will help determine whether the Bureau will use the printing capacity at USGS as authorized in the Departmental Manual, or use the private sector for printing. The costs as documented by the Montana State Office must include all costs associated with printing, such as a mileage to and from the contractor, salaries for press inspection, transportation charges, etc. At the present time, memorandums are in the surnaming process for items Nos. 2 and 3 at the WO. Wyoming State Office has forwarded a draft to the WO for item No. 5, and the Service Center has a final ready for Action No. 1. All other actions are working.

Workshop Recommendations:

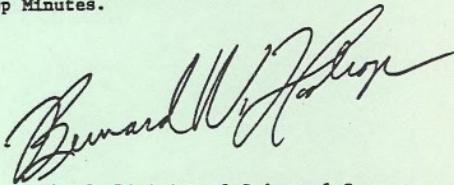
1. Retitle the WO Division of Cadastral Survey to the Division of Surveying and Mapping.
2. Reorganize the State Office functions of digital cartography, cartographic mapping, photogrammetry, and aerial photography under one division that is consistent throughout the Bureau (perhaps the Division of Operations).
3. The WO prepare and distribute a memorandum explaining the complexities involved with having interoffice Bureau agreements and transfers of funds.
4. The production of Bureau 1:100,000 scale maps should be automated.
5. The revision cycle for Bureau 1:100,000 scale maps should begin in FY 1985.

Eml. 4-2

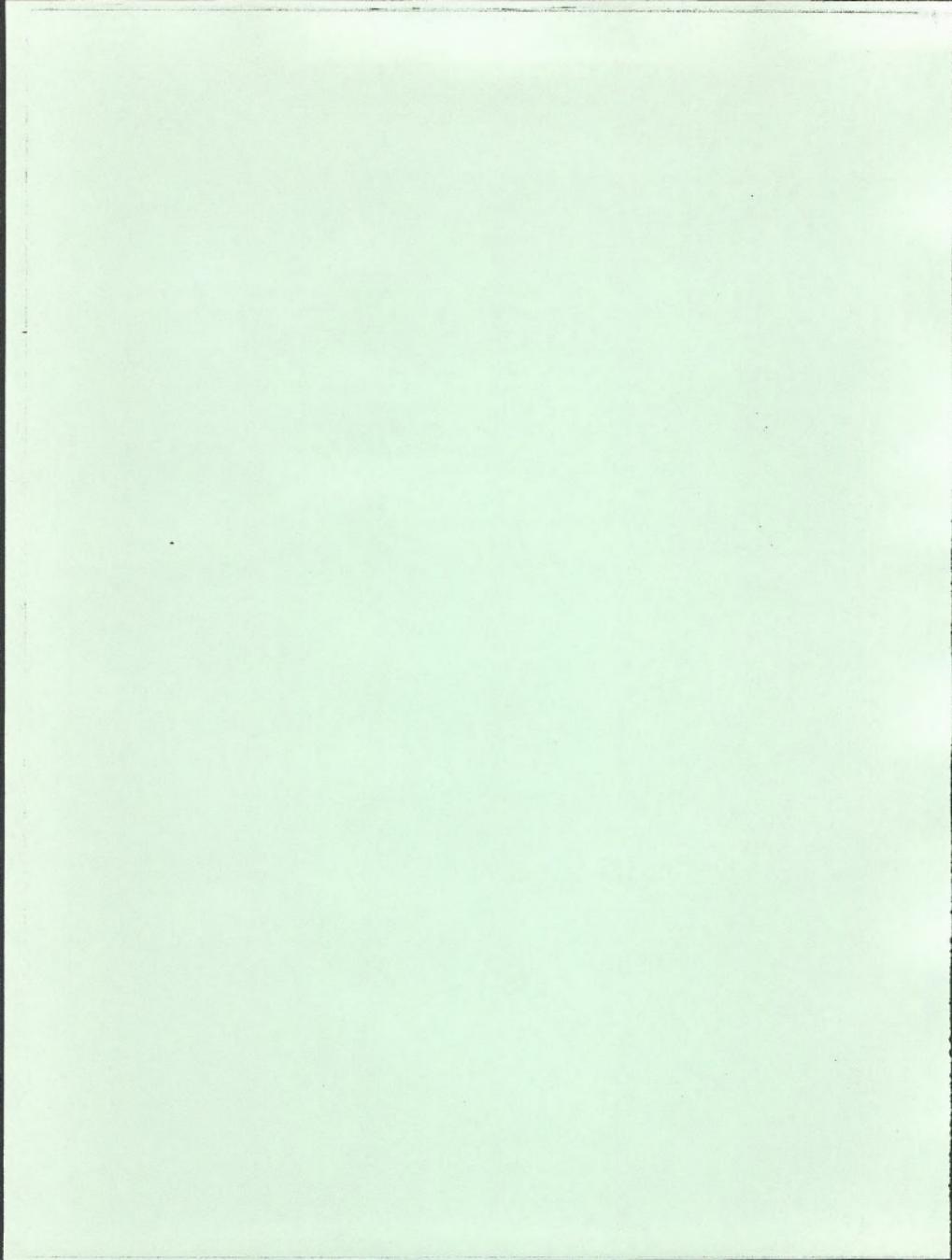
6. The WO develop policy/legislation as required (850/720) to continue to acquire and use 4920 copy fee/reimbursable funds generated by map sales to assist in map maintenance, reprinting, distribution, and storage.
7. An annual Mapping and Aerial Photography Workshop should be conducted.
8. Funding of the Bureau's 1:100k program should be based on the benefiting activities' yearly proportion of the Bureau's total budget.

Recommendation Nos. 1 and 2 are in the process of evaluation along with the mapping study that is being conducted by Management Research. A memorandum is being written by WO Cadastral Survey (720) and will be forwarded to Budget in order to implement item No. 3. Items Nos.4 and 5 were addressed by Work Group No. 1, and a final report has been forwarded to all attendees. Comments related to the Work Group findings must be forwarded to the Director (720) by May 16, 1983. A letter has been prepared by the WO Division of Cadastral Survey to initiate recommendation No. 6. State Offices should submit requirements concerning action item No. 7 as part of the PAWP/AWP process.

We wish to express our appreciation to the DSC (D-410) for organizing and moderating the Workshop, their participation in several of the action items, and consolidation of the Workshop Minutes.



Chief, Division of Cadastral Survey





United States Department of the Interior

BUREAU OF LAND MANAGEMENT
DENVER SERVICE CENTER
DENVER FEDERAL CENTER, BUILDING 50
DENVER, COLORADO 80225

IN REPLY REFER TO: 9670 (D-417)

March 1, 1983

Memorandum

To: All Attendees of the Mapping and Aerial Photography Workshop
From: Chief, Cartography Section
Subject: Recommendations Concerning Completion of the Intermediate Scale Map Series

It was our task at the recent Mapping and Aerial Photography Workshop, held in Denver, February 22-25, to make recommendations for the completion of the Intermediate Map Series and implementation of a revision cycle program. Please find enclosed a package which contains, in Part I, the final recommendations of the workgroup, and in Part II, the information that was used to formulate these recommendations.

I would like to thank the following people for their help in evaluating this large volume of data and making recommendations for its handling.

Diane Colcord, Nevada State Office
Gary Stevens, Idaho State Office
Bill Glenn, Oregon State Office
Larry Taddia, Arizona State Office
Pete Van Wyhe, Denver Service Center
Butch Hayes, Washington Office

Please call me at FTS 234-2167 if you wish to make any comments concerning these recommendations.

Enclosures 2
1 - Part I
2 - Part II

Marilyn Mogg

Emel. 5-1

PART I
RECOMMENDATIONS OF Workgroup # 1

1. Funding of the 100K Program should be based on the benefitting activities' yearly proportions of the Bureau's total budget.

Justification: It is cumbersome and subjective to attempt to base the funding of 100K map production on the percentage of use of 100K maps by each Bureau program. Therefore a fundamental formula such as that described above (See page 4, columns 1 & 2) will spread the cost of the program over all benefitting activities and reflect yearly fluctuations in the individual budgets.

2. The procedures for the Intermediate Scale Map Series production and revision should be automated with a variation of Alternative A4, reformatte below.

Equipment requirements consist of:

4 digitizing tablets	70,000
4 input graphic terminals	80,000
1 edit graphic terminal	20,000
2 alpha-numeric terminals	6,000
2 electro-static plotters	10,000
1 flatbed plotter	100,000
Software development	30,000
Upgrade C330	<u>60,000</u>
	<u>376,000</u>

Total Cost for Automated Completion of 100K Program

Year		# Maps Completed
1	938,253	66
2	590,365	86
3	619,883	92
4	650,878	92
5	683,422	92
6	717,593	92
7	<u>430,555</u>	55
	<u>4,630,949</u>	

Justification:

- A. Automation will ensure timely completion of the Intermediate Scale Map Series.
- B. There will be a savings of approximately \$400,000 in the total cost of the program.
- C. The yearly revision cycle costs will be reduced by approximately 40%.

- D. Use of the D-442 computer will not affect efficiency.
Additional costs incurred by possible shift work are offset by reduction in hardware maintenance costs.
 - E. Use of the D-442 computer will allow utilization of systems management expertise and spreads the cost of a systems manager between 2 Divisions.
 - F. The "parcel generator" will build a data base of surface and mineral status information available to all field offices.
 - G. The system will eventually utilize the data base made available from ALMRS/PLSS/GCDB.
 - H. The data base will become a major source for update of surface and mineral status maps at all scales.
 - I. The "parcel generator" will make a significant impact on state office support to the 100K program in terms of reducing status research and plotting.
 - J. This "Automated Cartographic System" would not be a unique software system, but part of an existing GIS.
 - K. The system could be used to support GIS activity in State Offices (with or without systems of their own).
3. The revision cycle should be implemented starting in FY 1985.

Justification: The 100K program is in its eighth year. Many of the existing maps are already out-of-date and/or out-of-stock. We are reprinting in many cases without completing the necessary reviews or making corrections.

PART II

Introduction:

This information was put together to analyze the various options for completing the Intermediate Scale Map Series, and for implementing a review and revision cycle for maintenance of this series.

It is our intention that the reader bring forth questions concerning clarity and/or suitability of the figures, and make recommendations about the handling of the program. It should be noted that this data reflects only those costs currently incurred at the Denver Service Center for production of 100K maps.

General Information. The Intermediate Scale Map Series was begun by BLM in 1975. At the end of FY 82, 562 maps were completed, about 49% of the total number identified to complete the program. The original program planned for a production level of 100-120 maps per year. This level was maintained until 1983 when funding was dropped to allow production of only 66 maps per year.

Completion of the Intermediate Scale Mapping Program

Alternative K1

Description:

1. The method of production is manual.
2. The level of funding allows for the production of 66 quads.
3. Funding allows for the purchase of 66 base negatives from USGS.

Considerations:

1. The reduced funding levels extend the program by 3 years.
2. The purchase of 66 sets of base negatives (3B's) is about 1/2 of the production by USGS. In previous years funding allowed for the purchase of 3B's as they were completed. A reduction in the number of yearly purchases will result in a 25% increase in price for those sets produced by USGS but not purchased by BLM immediately.

Alternative K2

Description:

1. The method of production is manual.
2. The level of funding allows for the production of 66 quads.
3. Funding allows for the purchase of 100 base negatives from USGS.

Considerations:

1. The reduced funding level extends the program by 3 years.
2. The funding of 100 sets of negatives allows BLM to purchase base negatives at a rate comparable to USGS production thereby avoiding a 25% surcharge.

Alternative K3

Description:

1. The method of production is manual.
2. The level of funding allows for the production of 100 maps.

Considerations:

1. The program will be completed within 6 yrs.
2. Manual production at this level would require additional personnel, or contracting of various phases of production.

100K Production Costs
Per Map

Variable Costs *

Compilation (land net)	.25 WM
Plot surface status (labor)	.15 WM
Plot mineral status (labor)	.25 WM
Photolab labor	.25 WM
Scribing labor	.25 WM
Peeling labor	.50 WM
Edit labor	.25 WM
Press inspection (labor)	.10 WM
Photolab supplies	\$ 350
Cartographic supplies	270
<hr/>	
Totals	\$ 620 2.00 WM

* These costs do not reflect management or support overhead, or printing costs.

Yearly Funding for the Production of 66 100K Maps (Alternative R1)

	1 1983	2	3	4	5	6	
	Budget \$1000	% of Total	WM Dollars	PP & 3B's	20% Overhead	Total	
4111	Oil and Gas Leasing	16815	7	(9) 28800	5174	6795	40679
4112	Coal Leasing	14579	7	(9) 27000	5174	6435	32238
4113	Geothermal Leasing	1963	1	(1) 3700	739	888	5327
4114	Oil Shale Leasing	3362	2	(3) 8400	1478	1976	11854
4131	Mineral Material	1822	1	(1) 3000	739	747	4486
4132	Mining Law Admin.	5410	2	(3) 6300	1478	1556	9334
4133	Mineral Leasing	1412	1	(1) 2300	739	608	3647
4211	Energy Realty	6275	3	(4) 8800	2218	2044	13062
4212	Non-energy Realty	21615	9	(12) 24000	6653	6131	36784
4213	Withdrawal Process & Rev	3297	1	(1) 1900	739	528	3167
4310	Forest Management	5065	2	(3) 8700	1478	2036	12214
4321	Wild Horses & Burros	4443	2	(3) 4200	1478	1136	6814
4322	Grazing Management	30429	13	(17) 47600	9610	11420	68630
4331	Nat. History/Cultural Mgmt	4055	2	(3) 5400	1478	1376	8254
4332	Wilderness Management	11302	5	(7) 20300	3696	4799	28995
4333	Recreation Management	5612	3	(4) 8400	2218	2124	12742
4340	Soil, Water, Air	15487	7	(9) 27000	5174	6435	38609
4350	Wildlife Habitat Mgmt.	13307	6	(8) 27200	4435	6327	37962
4360	Fire Management	8324	4	(5) 20500	2957	4691	28148
4410	Planning	7443	3	(6) 8800	2218	2204	13222
4520	BIM PROG Option Surveys	10138	5	(7) 17500	3696	4239	25435
4610	Firefighting	3732	2	(3) 6600	1478	1616	9694
4712	Recreation Maintenance	3336	1	(1) 3600	739	868	5207
4713	Transportation Maintenance	2760	1	(1) 3800	739	908	5447
4740	Resource Protection	1828	1	(1) 2500	739	648	3887
2120	Recreation Construction	1241	1	(1) 2500	739	648	3887
2200	Access	1747	1	(1) 2500	739	648	3887
2300	Land Acquisition	3243	1	(1) 3000	739	748	4487
8100	Range Improvements-Public	12116	5	(7) 17500	3696	4239	25435
8200	Range Improvements-Util.	1528	1	(1) 2500	739	648	3887
TOTAL					507,308		

Yearly Funding for the Production of 66 100K Maps (Alternative K2)

	1 1983	2	3 (w/o overhead) WM Dollars	4	5	6	7	
	Budget \$1000	% of Total		3B's	PP	Overhead	Total	
4111	Oil and Gas Leasing	16815	7	28800	2800	2864	6893	41357
4112	Coal Leasing	14579	7	27000	2800	2864	6533	39197
4113	Geothermal Leasing	1963	1	3700	400	409	902	5411
4114	Oil Shale Leasing	3362	2	8400	800	818	2004	12022
4131	Mineral Material	1822	1	3000	400	409	762	4571
4132	Mining Law Admin.	5410	2	6300	800	818	1584	9502
4133	Mineral Leasing	1412	1	2300	400	409	622	3731
4211	Energy Realty	6275	3	8800	1200	1228	2246	13474
4212	Non-energy Realty	21615	9	24000	3600	3683	6257	37540
4213	Withdrawal Process & Rev	3297	1	1900	400	409	542	3251
4310	Forest Management	5065	2	8700	800	818	2064	12382
4321	Wild Horses & Burros	4443	2	4200	800	818	1164	6982
4322	Grazing Management	30429	13	47600	5200	5320	11624	69744
4331	Nat. History/Cultural Mgmt	4055	2	5400	800	818	1404	8422
4332	Wilderness Management	11302	5	20300	2000	2046	4869	29215
4333	Recreation Management	5612	3	8400	1200	1228	2166	12994
4340	Soil, Water, Air	15487	7	27000	2800	2864	6533	39197
4350	Wildlife Habitat Mgmt.	13307	6	27200	2400	2455	6411	38466
4360	Fire Management	8324	4	20500	1600	1637	4747	28484
4410	Planning	7443	3	8800	1200	1228	2245	13473
4520	BLM PROG Option Surveys	10138	5	17500	2000	2046	4309	25855
4610	Firefighting	3732	2	6600	800	818	1644	9862
4712	Recreation Maintenance	3336	1	3600	400	409	882	5291
4713	Transportation Maintenance	2760	1	3800	400	409	922	5531
4740	Resource Protection	1828	1	2500	400	409	662	3971
2120	Recreation Construction	1241	1	2500	400	409	662	3971
2200	Access	1747	1	2500	400	409	662	3971
2300	Land Acquisition	3243	1	3000	400	409	762	4571
8100	Range Improvements-Public	12116	5	17500	2000	2046	4309	25855
8200	Range Improvements-Util.	1528	1	2500	400	409	662	3971
TOTAL							522,253	

EPA-5-1

Yearly Funding for the Production of 100 100K Maps (Alternative K3)

	1 1983	2	3	4	5	6	
	Budget \$1000	% of Total	(w/o overhead) WM Dollars	PP & 3B's	20% Overhead	Total	
4111	Oil and Gas Leasing	16815	7	(14) 44800	7140	10388	62328
4112	Coal Leasing	14579	7	(14) 42000	7140	9828	58968
4113	Geothermal Leasing	1963	1	(2) 7400	1020	1684	10104
4114	Oil Shale Leasing	3362	2	(4) 11200	2040	2648	15888
4131	Mineral Material	1822	1	(2) 6000	1020	1404	8424
4132	Mining Law Admin.	5410	2	(4) 8400	2048	2088	12528
4133	Mineral Leasing	1412	1	(2) 4600	1020	1124	6744
4211	Energy Realty	6275	3	(6) 13200	3060	3252	19512
4212	Non-energy Realty	21615	9	(18) 36000	9180	9036	54216
4213	Withdrawal Process & Rev	3297	1	(2) 3800	1020	964	5784
4310	Forest Management	5065	2	(4) 11600	2040	2728	16368
4321	Wild Horses & Burros	4443	2	(4) 5600	2040	1528	9168
4322	Grazing Management	30429	13	(26) 72800	13260	17212	103272
4331	Nat. History/Cultural Mgmt	4055	2	(4) 7200	2040	1848	11088
4332	Wilderness Management	11302	5	(10) 29000	5100	6820	40920
4333	Recreation Management	5612	3	(6) 12600	3060	3132	18792
4340	Soil, Water, Air	15487	7	(14) 42000	7140	9828	58968
4350	Wildlife Habitat Mgmt.	13307	6	(12) 40800	6120	9384	56304
4360	Fire Management	8324	4	(8) 32800	4080	7376	44256
4410	Planning	7443	3	(6) 13200	3060	3252	19512
4520	BLM PROG Option Surveys	10138	5	(10) 25000	5100	6020	36120
4610	Firefighting	3732	2	(4) 8800	2040	2168	13008
4712	Recreation Maintenance	3336	1	(2) 7200	1020	1644	9864
4713	Transportation Maintenance	2760	1	(2) 7600	1020	1724	10344
4740	Resource Protection	1828	1	(2) 5000	1020	1204	7224
2120	Recreation Construction	1241	1	(2) 5000	1020	1204	7224
2200	Access	1747	1	(2) 5000	1020	1204	7224
2300	Land Acquisition	3243	1	(2) 6000	1020	1404	8424
8100	Range Improvements-Public	12116	5	(10) 25000	5100	6020	36120
8200	Range Improvements-Util.	1528	1	(2) 5000	1020	1204	7224
TOTAL						775,929	

Total Costs For Completion of the 100K Program

Alternative K1: Year*		Alternative K2: Year*		Alternative K3: Year*	
1	507,308	1	522,253	1	775,929
2	532,673	2	548,365	2	814,725
3	559,309	3	575,784	3	855,462
4	587,272	4	604,573	4	898,235
5	616,636	5	634,802	5	943,146
6	647,467	6	628,454	6	778,095
7	679,841	7	622,169		
8	713,833	8	653,277		
9	<u>749,525</u>	9	<u>685,942</u>		
TOTAL	5,593,862		5,475,619		5,065,592

*A 5% inflation figure is added to each consecutive year

Revision Cycle for the 100K Program

Review Considerations

BLM has identified 5 areas for review and revision of its edition:

1. Topography - 309 of the 562 1:100,000 scale Surface and Mineral Maps have been printed in planimetric versions because USGS had not yet generated topography and BLM considered these high priority areas. Topography is now available in some cases.
2. Surface and Mineral Status Update
3. Cadastral grid update
4. Addition of physical and cultural features - Field personnel have expressed the need for more detailed base information, such as roads and trails, for the conduct of specific programs.
5. Additions to the periphery of quads - Field personnel have identified a need for alterations to the 30 minute x 60 minute format of some sheets. In cases where States boundaries fall close to, but not on, a 1 degree increment of latitude or longitude, users would like to see the map extended to State lines.

B. Priorities

Initial priorities for revision will be given to those maps which are out of print, printed in planimetric versions, or are indicated as necessary by field offices. Within these parameters, consideration will be given to the planned revision cycle of USGS. Continued maintenance will be planned with an estimated required revision of 75%.

C. Costs

Costs for review and revision are estimated at 1 workmonth per map. An additional workmonth per year will be required in the State Offices for the maintenance of an errata file. Each state must also program money to cover printing costs for its maps. A procurement amount of \$2,000 for the purchase of revised USGS base plates should be planned annually by DSC. State Office Mapping Coordinators will be asked to include requests for revisions at the time of PAWP submittals.

Revision Cycle Alternatives

Alternative R1:

Cycle - 6 year

Number of maps - 190

Workmonths required at DSC - 190

Workmonths Cost - \$513,000

Procurement Cost - \$6,000

Yearly Total Cost - \$519,000

Alternative R2:

Cycle - 7 year

Number of maps - 160

Workmonths required at DSC - 160

Workmonth Cost - \$432,000

Procurement Cost - \$4,000

Yearly Total Cost - \$436,000

Alternative R3:

Cycle - 8 year

Number of maps - 140

Workmonths required at DSC - 140

Workmonth Cost - \$378,000

Procurement Cost - \$3,000

Yearly Total Cost - \$381,000

NOTE: These alternatives do not consider additional workmonths that may be required to make revisions 4 & 5 as noted on page 5. Additional study is needed to assess the required resources.

Automation of the Cartographic Process

Description

By "Automation of the Cartographic Process" we are referring to the use of graphic terminals and plotters to maximize the efforts of certain labor intensive mapping procedures such as compilation and negative engraving. Instead of the manual procedure of hand scribing the negatives necessary for photo and lithographic reproduction, a flatbed plotter can be used to scribe a negative with greater accuracy and in less than half the time as an experienced cartographic technician. With software development (referred to as a "parcel generator"), the manual plotting of township and range, and section subdivisions for parcel surface and subsurface ownership identification, can be streamlined for faster and more accurate compilation manuscripts. As well as making the compilation process more efficient this procedure will be building and/or adding to a data base accessible to all States. Included in this package, please find descriptions of 4 alternative methods for automating the 100K Map series production process and revision cycle, and their impacts on the total program.

Considerations:

1. The "parcel generator" will build a data base of surface and subsurface status accessible to all States for resource inventories, and analyses.
2. The data base will become a major source for fast, accurate revisions of surface and subsurface status maps at all scales.
3. Successful automation of the 100K Mapping Program is dependent on the development of software for parcel generation, which can be integrated with existing GIS software and eventually with the ALMRS/PLSS/GCDB.
4. The system as a whole, will be useful for support to W.O. and States in providing digital data for resource inventories.
5. Automation brings about additional costs in yearly maintenance costs for equipment, software, and data bases. These costs must be considered in any impact analysis.
6. This Automated Cartographic System would not be a unique software system but part of an existing G.I.S.

Automated Completion of the 100K Program

Alternative A1

Description:

1. Equipment consist of 2 digital input stations, 1 edit station, and 1 flatbed plotter with scribing head.
2. Stations would be driven by the Data General C330, in D-442 (Branch of Scientific Systems Application).
3. Equipment requirements consist of:

2 digitizing tablets	35,000
2 input graphic terminals	40,000
1 edit graphic terminal	20,000
2 alpha-numeric terminals	6,000
1 electro-static printer/plotter	5,000
1 flatbed plotter	100,000
Software development	30,000
Upgrade to C330	<u>60,000</u>
	\$296,000

Considerations:

1. 2 phases of map production, compilation and scribing, would be affected.
2. This set-up would require access to the D-442 (Branch of Scientific Systems Applications) computer which is currently being used almost exclusively for developmental work.
3. There would be a requirement for workmonth support to D-442.
4. Use of the DG-C330 would require upgrading to support operational use.
5. 2 data input stations are considered the minimum requirement to effectively reduce map production costs.
6. Estimated improved efficiency to 100K production is 10% in year 1, 20% in year 2, and 30% in years following.
7. Estimated improved efficiency to 100K revision cycle is 30%.

Alternative A2

Description:

1. Equipment consists of 2 digital input stations, and 1 edit station.

2. Stations would be driven by the Data General C330 located in D-442 (Branch of Scientific Systems Application).

3. Equipment requirements consist of:

2 digitizing tablets	35,000
2 input graphic terminals	40,000
1 edit graphic terminal	20,000
2 alpha-numeric terminals	6,000
1 electro-static plotter	5,000
Software development	30,000
Upgrade to C330	60,000
	\$196,000

Considerations:

1. Only the compilation phase of map production would be affected.
2. This alternative would require access to the D-442 computer which is currently being used almost exclusively for developmental work.
3. There would be a requirement for workmonth support to D-442.
4. Use of the DG-C330 would require upgrading to support operational use.
5. 2 data input stations are considered the minimum requirements to effectively reduce map production costs.
6. Estimated improved efficiency to 100K production is 10% in year 1, and 20% in years following.
7. Estimated improved efficiency to the 100K revision cycle is 30%.

Alternative A3

Description:

1. Equipment consists of 2 digital input stations, 1 edit station and 1 flatbed plotter with scribing head.

2. Stations would be driven by a mini-processor.

3. Equipment requirements consists of:

1 mini-processor	190,000
2 digitizing tablets	35,000
2 input graphic terminals	40,000
1 edit graphic terminal	20,000
2 alpha-numeric terminals	6,000
1 electro-static printer/plotter	5,000
1 flatbed plotter	100,000
Software development	30,000
	\$426,000

Considerations:

1. The compilation and scribing phases of map production would be affected.
2. 2 data input stations are considered the minimum requirement to effectively reduce map production costs.
3. The procurement of a mini-processor would require workmonth support for systems and data base management
4. Estimated improved efficiency to 100K production is 10% in year 1, 20% in year 2, and 30% in years following.
5. Estimated improved efficiency to the 100K revision cycle is 30%.

Alternative A4

Description:

1. Equipment consists of 4 digital input stations, 1 edit station and 1 flatbed plotter.
2. Stations would be driven by a mini-processor.
3. Equipment requirements consist of:

1 mini-processor	190,000
4 digitizing tablets	70,000
4 input graphic terminals	80,000
1 edit graphic terminal	20,000
2 alpha-numeric terminals	6,000
2 electro-static plotters	10,000
1 flatbed plotter	100,000
Software development	30,000
	\$506,000

Considerations:

1. The compilation and scribing phases of map production would be affected.
2. The procurement of a mini-processor would require workmonth support for systems and data base management.
3. Estimated improved efficiency to 100K production is 10% in year 1, 30% in year 2, and 40% in years following.
4. Estimated improved efficiency to the 100K revision cycle is 40%.

Total Costs for Completion (Automated) of the 100K Program

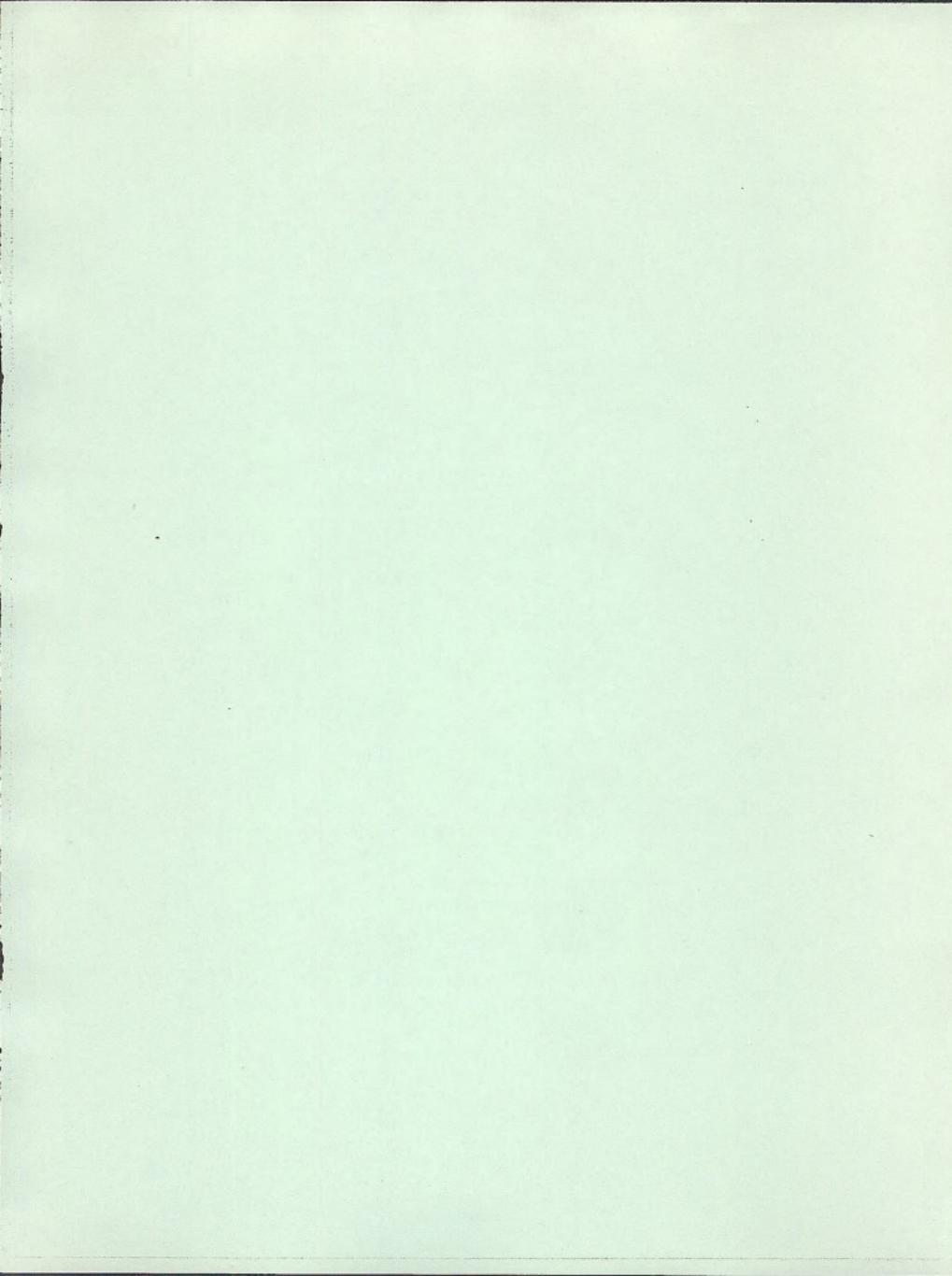
Alternative A1:		Alternative A2:		Alternative A3:		Alternative A4:		
Year*	# Maps Produced	Year *	# Maps Produced	Year*	# Maps Produced	Year*	# Maps Produced	
1	822,253	66	1	722,253	66	1	948,253	66
2	590,365	73	2	590,365	73	2	590,365	86
3	619,883	80	3	619,883	80	3	619,883	92
4	650,878	86	4	650,878	80	4	650,878	92
5	683,422	86	5	683,422	80	5	683,422	86
6	717,593	86	6	717,593	80	6	717,593	92
7	753,472	86	7	753,472	80	7	753,472	86
8	105,486	12	8	356,015	36	8	105,486	12
TOTALS: **			5,093,881			5,069,352		
4,943,352							4,794,949	

* A 5% inflation figure is added to each consecutive year

**A yearly maintenance figure of \$40,000 for hardware and software management is added.

SUMMARY TABLE

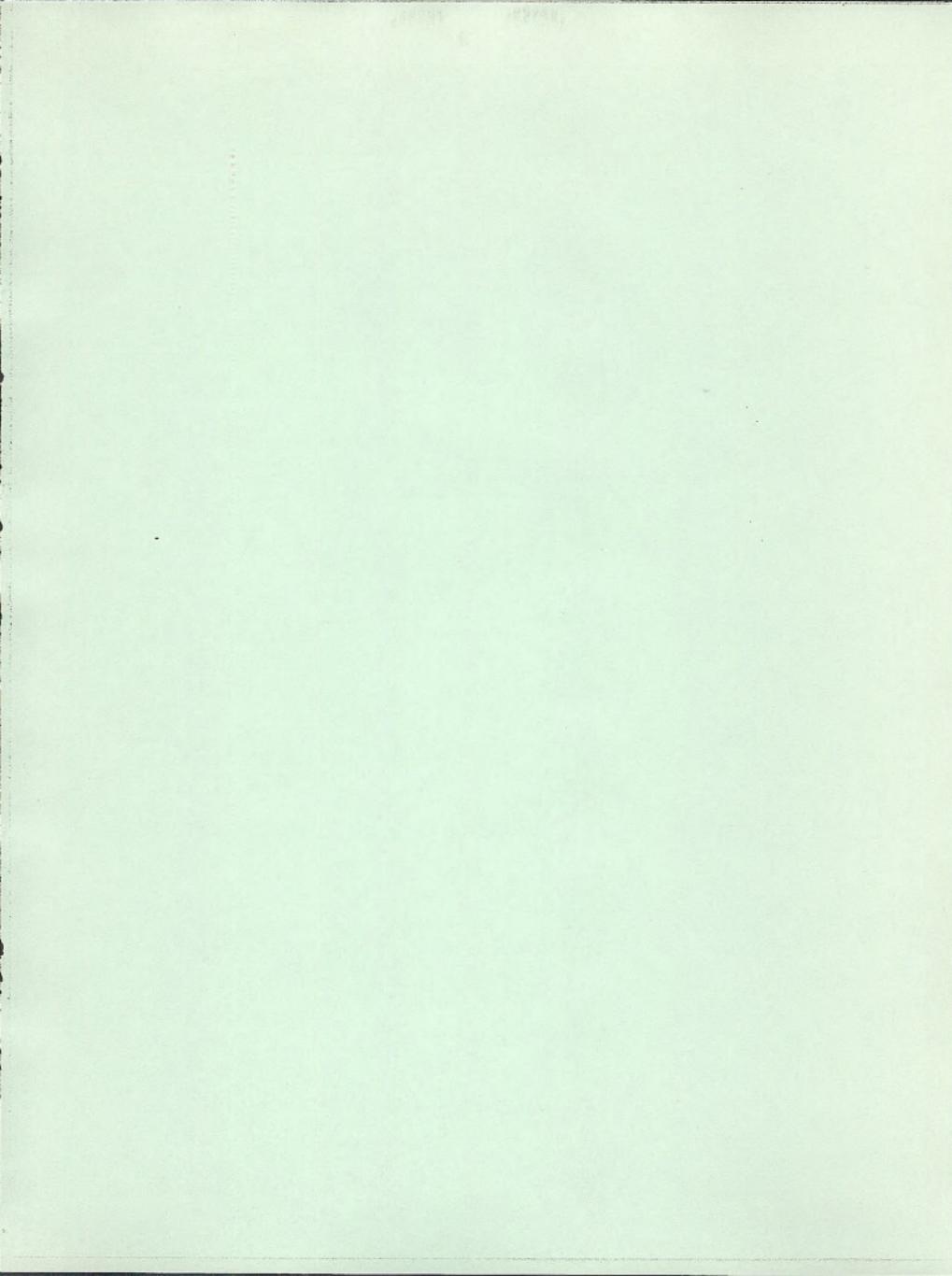
	Completion Cost	Completion Time	Yearly Cost
<u>MANUAL</u>			
Completion of 100K Program			
K1	5,593,862	9 years	
K2	5,475,619	9 years	
K3	5,065,592	6 years	
Revision			
R1			519,000
R2			436,000
R3			381,000
<u>AUTOMATED</u>			
Completion of 100K Program			
A1	4,943,352	8 years	
A2	5,093,881	8 years	
A3	5,069,352	8 years	
A4	4,794,949	7 years	
Revision			
R1			313,800
R2			263,200
R3			229,800



AUTOMATED CARTOGRAPHY

1. Current disparity of equipment and capabilities between state offices. States recognize the need for these automated systems, but lack the capability to acquire the hardware. The following states lack specific capability to use Automated Cartography/Spatial Information System: MT, ID, AZ, ES, NV and UT.
 - a. Acquire capability for all states.
 - b. Interim solution - share capabilities between states, minimizing impacts on existing state workloads.
 - c. Contract or lease capability.
2. Lack of uniform or fully functional automated cartography organization structure within states, Service Center and Washington office. Overlap exists between Remote Sensing, Automated Cartography, Spatial Information Systems at all organizational levels.
 - a. Functionally locate these activities in one organization.
 - b. Accelerate the Management Research Mapping Study, with inclusion of the new mineral functions.
3. Lack of guidance for personnel qualifications and requirements associated with Automated Cartography/Spatial Information Systems in the state offices. State offices are using over three G.S. series for map digitizing.
 - a. Have DSC and state offices define the skill and training/retraining (requirements) to implement this new "high tech" capability uniformly within states.
4. The Bureau lacks digitizing standards and uniform documentation for resource data captured with ADS/AMS/AHDS. Technical standards/guidelines should include data quality control and accuracy requirements.
 - a. Develop basic guidelines and/or standards in conjunction with state offices. This documentation should be simple and concise, providing for individual state flexibility.
5. The Bureau lacks internal coordination on the acquisition and use of new "high tech" Automated Cartography/Spatial Information Systems. Currently five separate systems are proposed, under development, or in operation within the Bureau, i.e. ALMRS, IDIMS, ADS/AMS/MOSS, RIPS, IFAMS.
 - a. Coordinate all present and future digital graphic systems with field requirements to insure maximum compatibility.

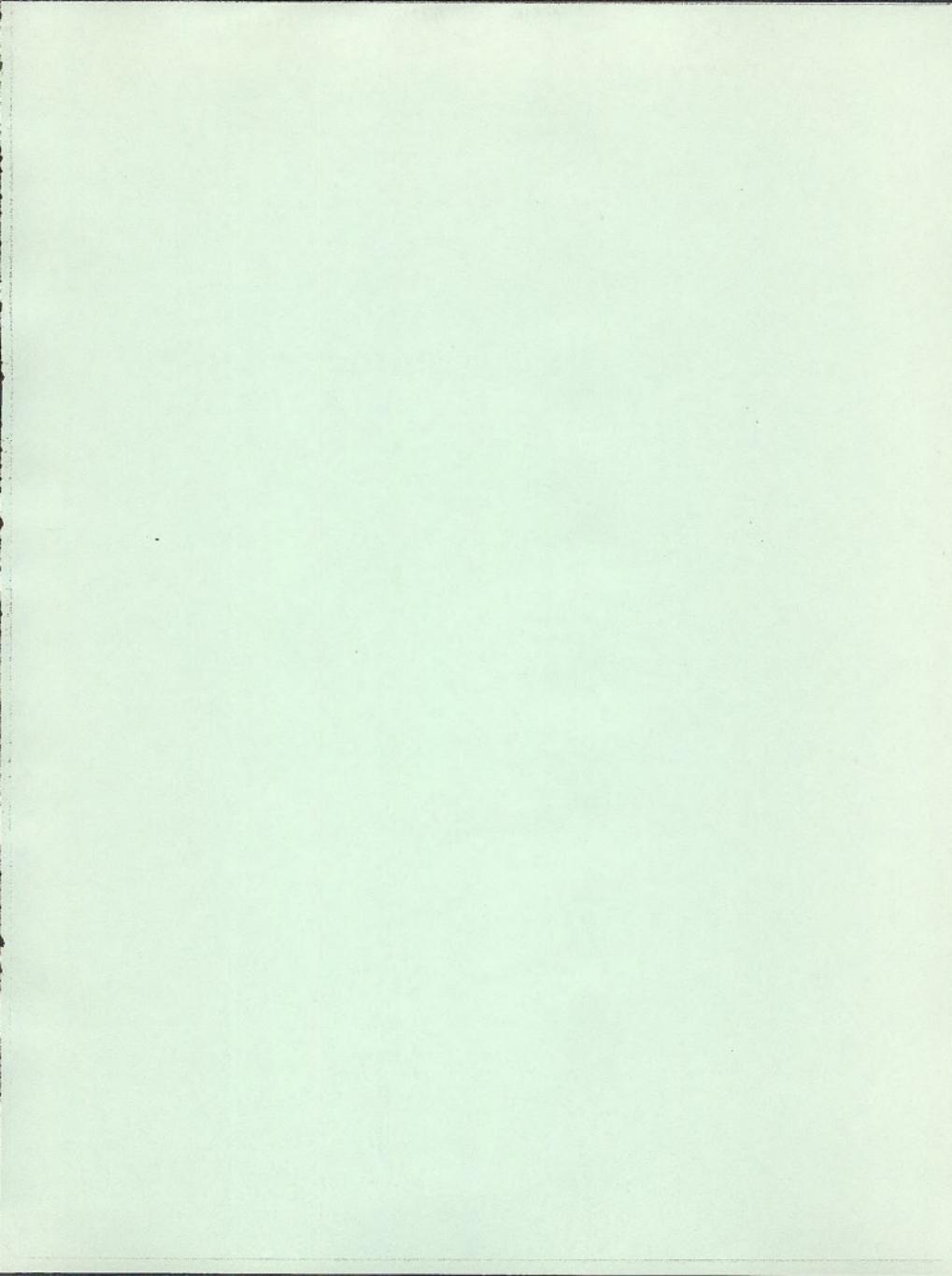
End. 6-1



TRANSPORTATION

1. Recommend a better definition of Bureau's Transportation System in Manual Section 9110.
2. Recommend standardization of transportation maps.
3. Recommend inventory base of 1:24,000 using ortho photo quad if available or topographic map if not. This base would be for administrative use in data collection, digitizing and for administration in areas requiring higher detail.
4. Recommend 1:100,000 multicolor map as primary Transportation System Map. A monochromatic edition may be produced if desirable. This edition would be used by land managers and be made available to the public.
5. Revise 9671 Carto Manual Transportation Section.

Note: It is the finding of this work group that these series are the best available, that contain the needed base data to produce user effective as well as cost effective transportation maps.



PRINTING COSTS & REGULATIONS

The work group assigned to this topic dealt with two main topics.

- 1) Are the costs incurred in printing the 1:100K maps at the present time the lowest costs available?
- 2) Some printing regulations (JCP) as viewed by the printing specialist appear to hinder the cartographic process.

Question 1:

Research of costs of products printed by four participating state offices would indicate that possibly the lowest cost of printing has not yet been achieved. These products have been printed in volumes normally larger than that of the 1:100K's but some have been near the same quantities. The prices of these similar products have ranged from 30 cents per map to 70 cents per map as compared to the one dollar plus cost of the 1:100K.

A new contract has been acquired using the USGS facilities at Reston, Virginia that will bring the cost of printing under the one dollar mark.

However, this still leaves somewhat of a gap in the costs between the 1:100K's and other open market prices through GPO.

Recommended Solution:

After contacting the Chief, Section of Cartography at DSC we found that a comparison study was planned and that any help would be useful to this study.

It was decided that since the Montana State Office posed the initial question that a printing contract through GPO, Seattle would be negotiated to print the next MSO 100K's.

The results from this contract on cost and quality of finished product will be used by both MSO & DSC to reach the desired results.

Question 2:

A sampling of state offices including the state presenting the question indicated that the question posed leaned more toward an organizational problem within the state than a problem confronting all Bureau cartographic operations.

Jmd. 3-1

1637

Memorandum

7/1/83

To: Office of Administrative Services
Chief, Division of Printing and Publications

From: Assistant Director, Administration

Subject: Sale of Publications

This is in response to Administrative Services Bulletin No. 32, dated October 18, 1982. We apologize for the delay in responding.

BLM is providing copies of various documents to the public on demand. This practice has been done since 1950 under authority granted to the Secretary of the Interior contained in Title 43 U.S.C., specifically Section 1460 which states:

"The Secretary of the Interior, or any of the officers of that Department may, when not prejudicial to the interests of the Government, furnish authenticated or unauthenticated copies of any official books, records, papers, documents, maps, plats, or diagrams within his custody and may charge therefore a sum equal to the cost of production thereof, plus the cost of administrative services involved in handling the records for such purpose, as the costs may be determined by the Secretary of the Interior or such subordinate officials or employees as he may designate....".

This is very similar to the same type of authority granted to the U.S. Forest Service under Title 7, U.S.C.; Section 1387 (Agriculture Adjustment Act).

The Bureau is required to make available to the public certain information as to the availability of public lands to be offered in our oil and gas simultaneous leasing programs and various maps that depict administrative surface and subsurface ownership and status. The documents sold by BLM are considered to be administrative in nature. Any documents that are considered for general public information purposes are referred to the Superintendent of Documents for possible sale. Fees collected are for the production and handling costs associated with each document and are deposited and credited to the specific program for which the original costs were incurred.

Documents sold consist of notices for tracts of public lands that will be available for drawings under the Bureau's simultaneous oil and gas leasing program. We also must prepare lists of the drawing winners. Approximately 30,000 requests are received per year for such documents. Also available to the public are various maps that depict surface and subsurface ownership, mineral leasing status, land ownership, site-specific recreation maps, and cadastral survey plats of surveyed public lands. There are over 15 different types of maps and plats, generating approximately 40,000 requests per year. The documents are produced to inform the public of the status of these affected lands.

Requests for these documents are largely from the local areas where the activities occur, basically the 11 western states. There is very little nationwide interest. These types of documents are not really suitable for sale by the Superintendent of Documents. As mentioned earlier, documents of general interest are referred to the GPO sales program.

If there are any questions, please contact Victor Trilling on 343-2125, or Stan Kephart on 343-6743.

John McElheran

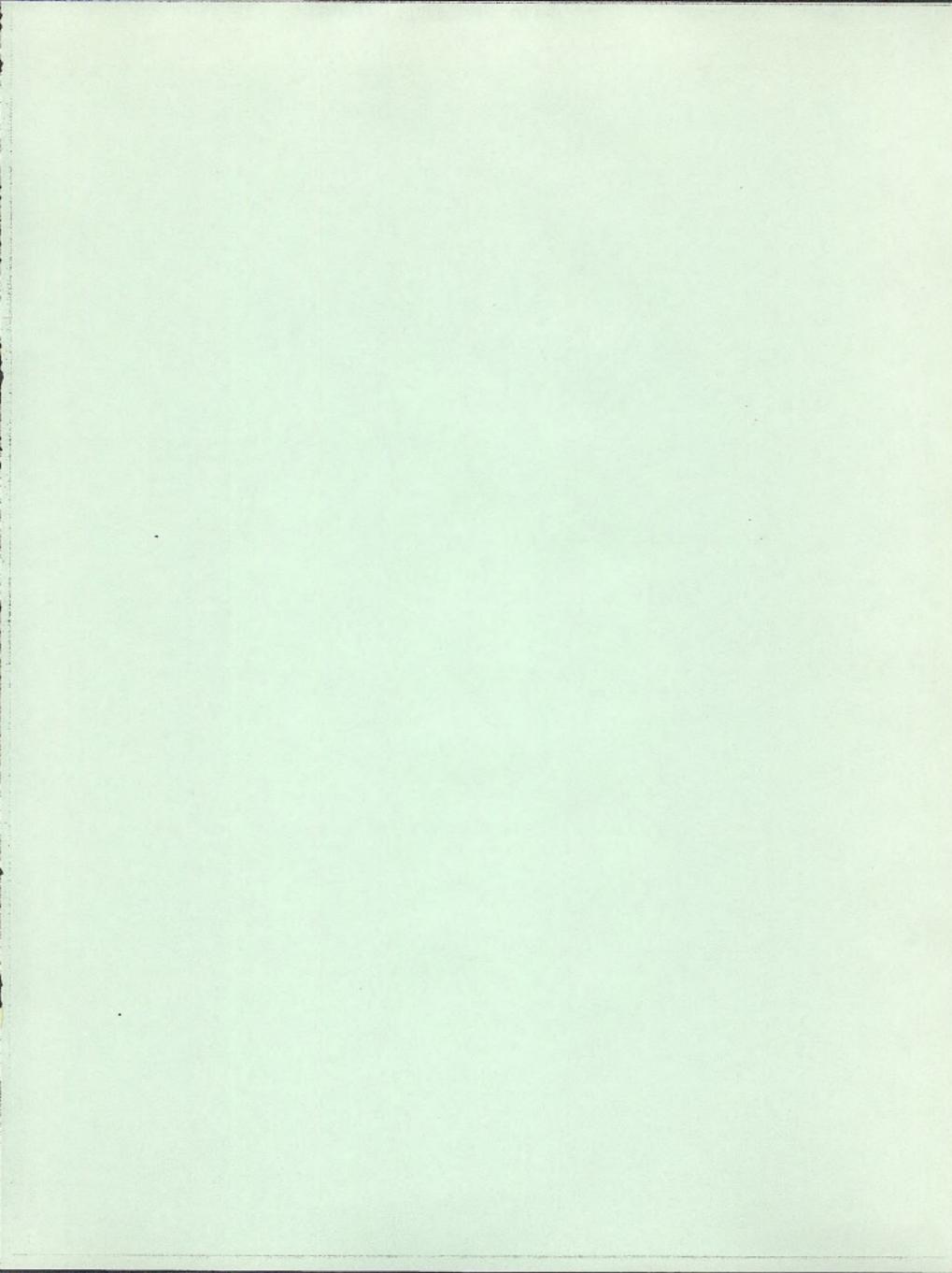
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cc: 810
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Encl 8-1b



ORTHOPHOTOGRAPHY RECOMMENDATIONS

Orthophotography should be recognized within the Bureau as a preferred medium for mapping resource data. Its value is minimal as a data source (i.e., for photo interpretation). Instead, it performs its most beneficial function as an inexpensive and accurate tool for spatially referencing resource phenomena. As such, it is far superior in both user acceptance and accuracy to any line map. In comparison to line map products of similar scale, orthophotography can be produced much faster and at less cost. For these reasons, we recommend that Bureau offices aggressively investigate the acquisition of first-time orthophotoquad coverage, especially before undertaking any cooperative efforts to complete 7 1/2' topographic map coverage.

Orthophotography can be used to serve in three categories:

1. Standard Resource Coverage: 7 1/2' 1:24,000 scale orthophotoquad products--produced to USGS specifications in the 48 contiguous states. 15' 1:63,360 scale in Alaska.
2. Special Purpose Coverage: Generally large scale orthophotography produced for site specific projects--frequently with contours.
3. Composite Thematic Products: The standard orthophotoquad with various resource data themes essentially working quality products.

1. FINDINGS

In order to assess each state's activities in the orthophotoquad program, representatives were asked to provide feed back to the following:

- Existing orthophotoquad coverage
- Additional coverage requirements
 - Initial base production
 - Revision program
- Support activity and funding available
- Existing & Proposed Interagency Agreements
- Adequacy of photo imagery & control
- Scanning process desired (GPM-2 can include DEM's, OR-1 or Z-2 produces photo image only)
- Source for production
 - USGS/In-house
 - Contract

Attached is the composite survey of all states represented, reflecting the above. Blank blocks indicate unanswered or unknown items at this time.

	STATE	EXISTING COVERAGE	NEEDS	SUPPORT ACTIVITY	AVAILABLE FUNDING	(E) EXISTING (P) PLANNED INTERAGENCY AGREEMENTS	ADEQUATE IMAGERY	ADEQUATE CONTROL	SCANNING METHOD	PRODUCTION SOURCE
AK	2% 60	Now 2630	4212, 4510 State	\$1 Mil 50 K 300K	E. USGS/BLM P. USGS/BLM NOS/FS/State	Yes	50%	GPM-2 7-2	USGS/In-house	
AZ	100% low quality	150	Benefitting	--	None	--	--	--	--	
CA	60%	Being Negotiated	4340	--	E. State/BLM SCS	Partial	Yes	--	SCS	
CO	--	1792	4112, 4114 4322, 4410	--	E. BLM/USGS P. BLM/FS SCS/F&WS	No	Yes	GPM-2	USGS/In-house	
Eastern States	--	Initial Base	4111, 4112	--	--	No	No	--	--	
ID	98%	26	A11	--	E. BLM/FS	Yes	Yes	--	--	
MT	75%	400	--	--	P. BLM/ASGS SCS	Yes	--	GPM-2 OR-1 Z-2	--	
NV	98%	88	4340, 4410 4212, 4113	--	P. BLM/USGS	Yes	Yes	--	USGS	
NM	200	--	Planning Coal	--	--	Yes	--	--	USGS	
OR	90%	--	Range Forestry	--	None	Partial	Yes	--	USGS/In-house	
UT	96%	Revision as required	A11	\$10K for products	E. BLM/USGS	Yes	Yes	OR-1 Z-2	USGS/In-house	
WY	90% (100% BLM)	Revision as required	A11	\$20K for products	E. State/FS SCS/USGS	Yes	Yes	OR-1 Z-2	USGS/In-house	

The results of the survey of meeting attendees on orthophotography activity in their respective states indicates a great variation among states. Some have cooperated for complete orthophotoquad coverage, are actively using orthophotoquads, and are planning for a revision cycle. Other states have little coverage with no plan to cooperate. Still others have comprehensive coverage, but are not actively using orthophotoquads as a field tool or base mapping medium.

The one consistent theme of the survey is the lack of funding available for orthophotography. We interpret this as primarily being a result of a failure to actively inform state and district users of the need, availability, and utility of orthophotoquads. There is a need for key individuals at the state office to familiarize themselves with the orthophotoquad program, its significance, and the opportunities it presents. If key individuals would then communicate this information to users, the potential for funding would be improved.

2. RECOMMENDATIONS

1. As a general recommendation to the state representatives we suggest that a new look be given to orthophotography activity in their states. The status of orthophotoquad production should be assessed with the potential for cooperative production in mind. Field users should be informed of the need and availability of orthophotoquads. To facilitate communication with field users, we recommend that one or more of the states with active orthophotoquad programs (Nevada, Utah, Wyoming) provide a package of orthophotoquad products to other states. Such products could include the orthophotoquad composited with land grid, land status, soils, vegetation, transportation, or other data.

Some additional recommendations on the specific types of orthophotography are as follows:

2. Standard Resource Coverage

First-time: In the lower 48 states it is recommended that the 1:24,000 scale 7 1/2' quad format be the standard for resource orthophotography. 1:25,000 scale would be acceptable in those areas/states where metric 7 1/2' topographic mapping has been performed or is planned. This is because of the universality of the 7 1/2'/1:24,000 base mapping products and the availability of cooperative production with the U.S. Geological Survey. For first-time coverage it is recommended that an auto-correlating orthophotomapper--such as the Gestalt GPM-2,3,4 be used--especially if 7 1/2 DEMs are not available. Cooperation with GS is preferred--because of cooperative funding, minimal contract overhead, and standard product specifications. When possible, other Federal and state agencies should be encouraged to cooperate to lower costs. Products from such cooperative efforts should include: (1) a duplicate negative of the quad-centered aerial photography,

(2) digital data suitable for production of a DEM
(or a finished DEM, however this may add cost),
(3) USGS standard orthophotoquad reproducibles with
land grid. Be cautious of unrealistic schedule commit-
ments by GS--carefully analyze their ability to produce
the products within your required time frame. If you
have doubts, you may want to consider other sources
for these products.

Revision Coverage: The principal recommendation for orthophotoquad revisions is that you consider using a digitally driven device--such as the OR-1. Generally, better image quality will be available from such machines. This, of course, assumes the availability of digital data suitable of driving such systems. Generally, the 7 1/2' 1:24,000 scale format is recommended, however, this should not exclude consideration of larger scales or different formats if they can be justified. Revision work may not be possible through cooperative contracts with GS--so it may be necessary to contract other sources of production. The NHAP photography should be given consideration as a source for revision orthophotography--of course, other sources could be used as appropriate.

3. **Special Purpose Coverage:** It is expected that the demand for such products will be limited to special projects. Generally, such orthophotography will have to be contracted with commercial organizations. At this time we see no purpose in establishing guidelines for scale or format of such products--as they will (and should be) determined by the requirements of specific projects.
4. **Composite Thematic Products:** Standards for such products have been developed as a result of the cartographic manual effort. We recommend that these standards be adhered to whenever possible.

MAPS MADE BY ONSHORE MINERALS PERSONNEL

<u>TYPE</u>	<u>SCALES</u>
<u>Known Leasing Areas</u>	1:62,500 - 1:500,000
Known Geothermal Resource Areas	Various scales
Known Recoverable Coal Resource Areas	Various scales
Known Geologic Structures	Various scales
Known Potash Leasing Areas	Open-file - 1:62,500
Known Oil Shale Leasing Areas*	1:250,000
* (work just beginning on these)	
<u>Prospectively Valuable</u>	
Oil and Gas	1:500,000
Coal	"
Geothermal	"
Potash	"
Sodium	"
Oil Shale	"
Tar Sands	"
Phosphate	"
Leasable Mineral Resource Occurrence/Leasable Development Potential (e.g., Phosphate Resource Occurrence/Phos. Dev. Potential (MR ¹ Series))	1:24,000; 1:100,000
Leasable Mineral and Waterpower Land Classification (I ² Series)	1:250,000
Tract Delineation maps	Various Scales

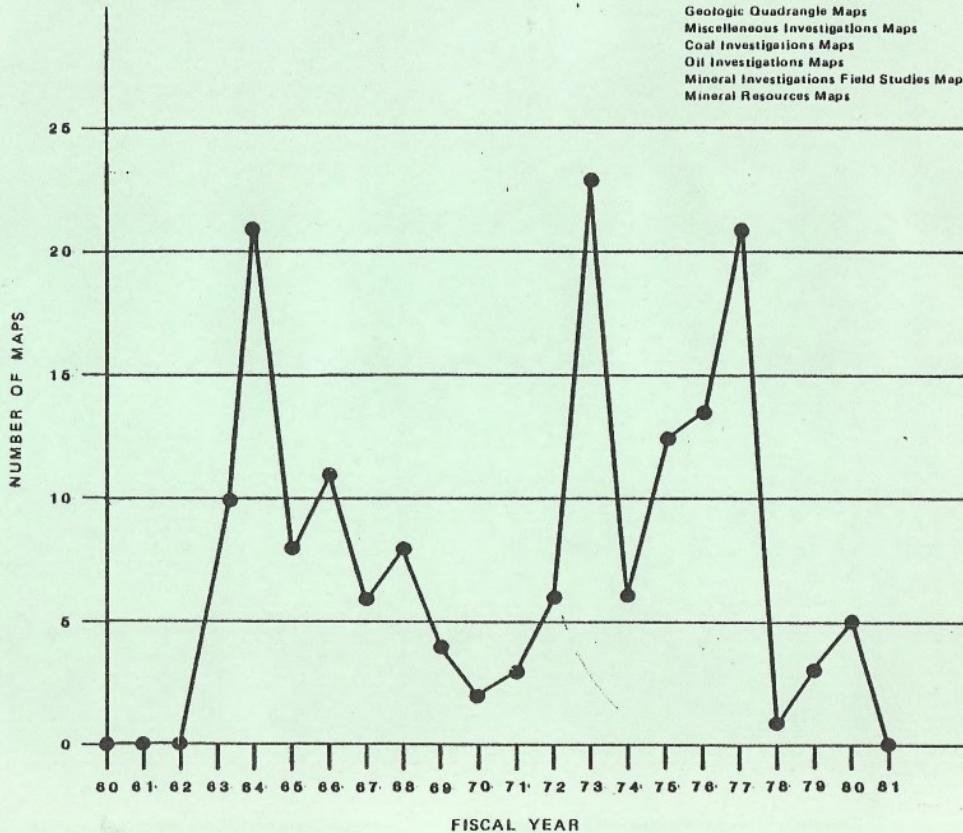
¹ Mineral Inv. Resource Maps² Miscellaneous Investigation Series Maps

<u>TYPE</u>	<u>SCALE</u>
Unit maps--showing configuration of units	Various scales to 1:500,000
Unit plats--identifying areas for clear listing	Various scales
Township plats--show distribution of rock units, mineral deposits, mining claims, cultural features, etc. (used as base for report illustrations)	1:62,500
Coal Resource Occurrence/Coal Development Potential*	1:24,000
*(some being done in Casper but not published)	
Field maps--oil and gas, lease boundaries, surface ownership, unit boundaries	1:2000
Maps for leases, drill hole locations, etc., PRLA's, Geologic Hazards (like H ₂ S) etc.	1:100,000; 1:250,000 1:500,000; 1:1,000,000
Geologic maps specific reports (MR, MF ³ , OF series) (used for classification, evaluation, mineral inventory)	Open-file Various scales
Geologic quadrangle maps (GQ series)	1:24,000; 1:48,000; 1:62,500
Phosphate Resource Occurrence/Phosphate Development Potential (MR series)	1:24,000; 1:100,000

³ Mineral Field Studies Maps

CONSERVATION DIVISION MAPS PUBLISHED VS. YEAR

MAP TOTALS INCLUDE:
Geologic Quadrangle Maps
Miscellaneous Investigations Maps
Coal Investigations Maps
Oil Investigations Maps
Mineral Investigations Field Studies Maps
Mineral Resources Maps



Bureau of Land Management
Library
Bldg. 50 Denver Federal Center
Denver, CO 80225

U.S. DEPARTMENT
BUREAU OF LAND
MANAGEMENT

BORROWER

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1983 Mapping and AI
workshop.

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